TAMPERE UNIVERSITY OF TECHNOLOGY

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BUSINESS MODEL EVOLUTION: Planning Capital Investment Strategy in Ambitious High-Growth Start-Ups.

Master of Science Thesis

Prof. Petri Suomala and Dr. Jouni Lyly-Yrjänäinen have been appointed as the examiners at the Council Meeting of the Faculty of Business and Technology Management on May 15, 2013.

ABSTRACT

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Ovelin is a Finnish start-up company founded in 2010 by the author of this thesis and another student of Tampere University of Technology. The mission of the company was and is to revolutionize music education, and to make learning to play an instrument more fun and motivating. To achieve that, Ovelin combines music education with the addictive features of computer games. By utilizing high-tech audio technology the games would be played on any device, with any real musical instrument, without using any additional equipment.

The business idea and plan the two co-founders wrote in 2010 received very positive feedback in general. However, building the extensive online music education service the two had envisioned would take years, and cost millions of Euros in development cost. At that point, neither of the co-founders had any experience in game development, music education or entrepreneurship. Thus, the team was unable to raise an investment for the venture solely based on a business plan, let alone the projected millions of Euros that the whole project might have cost. Thus, the team decided to break down the product development into several stages. Starting from a simple learning application, and eventually build it up over several stages into the service they envisioned and called StarEyes. This would in turn also cut the development costs into multiple chunks, a first one small enough that the team could gather it. And, should the development stage be successful, the team expected to raise larger financing rounds to support the next stage of product development.

In 2010, this thesis was initiated to formalize this plan of building a product and business over several stages in a more academic way. Thus, the concept of Business Model Evolution was created. Business Model Evolution is a framework built on the Business Model Canvas by Alexander Osterwalder (Osterwalder et. al, 2010) and its nine building blocks: Value Proposition, Target Customer, Distribution Channel, Customer Relationship, Value Configuration, Capability, Partnership Network, Cost Structure and Revenue Model. For each step of the

development, each of the nine blocks would have to be formalized, to describe a feasible business case for the current stage of the product. In the beginning of 2011, the thesis was almost concluded, and described the development of StarEyes over 6 development stages. However, at that point, the author decided to focus his time entirely on the development of Ovelin, and thus set the thesis aside unfinished. 18 months later, after the successful launch of Ovelin's first product, the author decided to finalize the thesis by comparing the planned development 18 months earlier to how Ovelin had developed until in reality. In other words, which parts of the plan did actually happen, and where did the real development significantly diverge from the planned Business Model Evolution concept.

The Business Model Evolution concept itself was very interesting, and was in many areas also beneficial to the development of Ovelin. For example, breaking down the concept into a smaller "Minimal Viable Product" turned out to be possible, and was achieved at a fraction of the expected overall budget. However, the rigor at which the plan was first formalized, adhering to academic principles, turned out not the most suitable for its purpose. In practical terms, it takes a lot of time, and builds much on assumptions that have not been confirmed or disproven yet. In some aspects, planning each of the steps this thoroughly was in some points even counter-productive. For example, it encourages the management to try to follow the plan, and make them reluctant to take new knowledge into account. On the other hand, re-visiting an 18 months old plan turned out to be rather interesting. The new knowledge and experience the team had gathered after this "first stage" caused much of what had been planned subsequently irrelevant or obsolete. Yet, many of the assumptions turned out to be surprisingly accurate.

As a consequence of both the positive and negative aspects of the initially chosen Business Model Evolution plan, the Ovelin management team eventually adopted a new approach. Usually it is advised that entrepreneurs have a vision of what they are aspiring to do with their startup. At the same time, the more immediate months should be planned thoroughly. Thus, the Ovelin team currently tries to follow thorough 6 months plan, while having formulated a 5-year vision too.

The term Business Model Evolution was chosen to highlight the idea that a large project can be developed over several stages, rather than to be developed in one major effort. Interestingly, the reality turned out to be even closer to the "evolution idea" as initially thought. Much like in biology, the development of a product has to take new situations in the environmental changes into account. In other words, planning several years ahead is very difficult, and can in the worst case even be counter productive. However, unlike in biology, it is still very advisable to have a vision of what the start-up is aiming to achieve, even if not all the steps in between can be foreseen at the outset.

PREFACE

Ovelin has been the most interesting and rewarding project I have ever started in my life. On the one hand, I am very passionate about what the company aspires to do. If successful, we can bring the joy of playing a musical instrument to millions of people. On the other hand, I also love what I am personally doing at Ovelin most of the time. I get to work with amazing people who get things done, and meet other entrepreneurs who are aspiring to shape the future for the better.

I am truly grateful for everyone that has helped me in the past years to get to the exciting place I am today. First and foremost, I want to thank my friend and co-founder Mikko Kaipainen for the fun, excitement and also painful moments with Ovelin, and also for always having my back. Also, I want to thank all current and former employees of Ovelin, our advisors and supporters, and also the doubters that incite me to try harder. Finally, I want to express my deep admiration to the people who have pushed forward the Finnish the startup movement in the last few years.

I also want to thank everyone from Tampere University of Technology that has contributed to my studies. First, I want to thank my Thesis supervisor Prof. Suomala for his support. Also, I am extremely grateful Dr. Lyly-Yrjänäinen for inspiring me to do my own projects, while constantly pushing me to do better work. A big thank you goes out to my friends from the international students club INTO and everyone from the Optoelectronics Research Centre ORC. Finally, I want to say kiitos to everyone that has made my years in Finland so amazing.

It is amazing how much joy I get out of playing the guitar nowadays, whether it is by myself, or with friends in the park. The fact alone that I can play the guitar now would have been worth all the efforts.

Helsinki, 19.5.2013

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Christoph Thür

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1 INTRODUCTION

1.1 ORGANIC GROWTH VSERSUS HIGH-GROWTH START-UPS

There are several possible reasons for an individual or group to start a company. People might chose to establish companies to enjoy the freedom of being their own boss, solving a problem they personally encountered, attempting to change the world, or for financial reasons ranging from the basic need to make a living to the prospects of becoming very wealthy. Whatever the reasons for individuals might be, societies need small companies to be funded and developed for at least two reasons. First, new companies solve existing or emerging problems with new products and services currently not served by the established companies. There may be several reasons preventing existing players to provide these products, for example marketing myopia (Levit, 1960), a lack of agility, or powerful industry structures that prevent innovation to maintain the status quo that serves the dominant players as cash cows. A second reason why western societies benefit from start-up companies is to substitute for the loss of jobs in smokestack companies (Rasila, 2004).

The different types of start-ups are as manifold as the people starting them, and the products and services these companies provide. However, one approach to distinguish between different ventures is to divide them, according to the anticipated function of the firm, into two groups here called organic growth firm and high-growth firm. One function for a start-up company is to provide a daily income for its owner and its employees in a lucrative niche where they can grow and strengthen their market position. This is the goal for the majority of entrepreneurs (Rasila, 2004). On the other hand, there are start-up companies intended to become substantial players in fast-growing or turbulent markets from the very beginning. In other words, these companies are attempting to change the playing field of the industry with a new product or technology, or with an innovative way to solve an old problem in a new way.

The former type of start-up, the one intended for a small but stable market environment is usually referred to as organically growing company (Rasila, 2004). The latter type of start-up, the one intended to play in a fast-growing or turbulent market, is called high-growth venture (Rasila, 2004). These latter kind of start-up companies are often associated with high-tech fields and nowadays especially with the “new” economy of Internet services. High-tech companies may often be aiming for a large market to amortize the huge development costs, or to leverage economies of scale through the often automated production. Companies offering internet services on the other hand target a large user base either because of the extreme economies of scale, internet services can be offered with little additional effort to many more users, or because the high user base itself add value. Of course

large user bases are also approached simply because there are more potential customers and thus there is more money to be made. In this "new" economy, especially when offering pure Internet services, high-growth companies are more likely, since there they can be born global and reach many customers as they are not bound to production and especially reproduction constraints. In other words, the entrance barrier to be able to market online is very low, compared to a physical distribution channel. On the other hand, a low market entrance barrier comes at the price of high competition and uncertainty of market adoption. Furthermore, many of these companies need to have a large user base, since their business model often relies on it. This is also true for companies where the user and the customer may be different. For example, search engines and social networks sell access to their extensive user bases to their customers. In other words, the individual user and the paying customer may not be the same, and the number of paying customers may actually be rather small compared to the total user base. Developing large enough customer base may be crucial for many of these firms. The phenomenon has been described as crossing the chasm, referring to the user adaptation phase between the early adopters to the early majority. Nevertheless, many of the recent success stories about high-growth companies came from this sector.

It is of course possible that a company initially anticipating to be serving a niche market is turning into a big player, and others intended for a wide market find themselves in a lucrative but small niche. However, there is often a correlation between the intended destination of a start-up company and its growth pattern. In other words, the capital requirements at the start-up phase may differ significantly depending on whether the company is intended to be an organically growing or high-growth company.

In a much discussed article "Startup = Growth", Paul Graham suggested that not every newly started company is a startup, indeed most companies are not (Graham, 2012). His statement is that starting a service business like restaurants, barbershops, plumbers etc. are not start-ups, except in a few unusual cases, because they are not designed to grow fast. Also the well-known start-up entrepreneur and professor at Stanford University Steve Blank defines a Startup as "a temporary organization designed to search for a repeatable and scalable business model" (Blank, 2011). The example of the barbershop does not fulfill this definition, because the business model is clear and pretty much given by the status quo. However, if a group of people would say utilize automated machines to cut hair, it might very well be considered a start-up.

The growth pattern of a firm is the phases it takes from an initial idea to the mature, anticipated target stage of that firm. In other words, the growth pattern describes what happens between the business idea and an established and sustainable business. The two different types of start-up companies introduced above, organic and high-growth, often differ in their growth patterns.

At the early stage of any company, typically two parameters are crucial for the ventures success: the ability and skills of the founding team, and the availability of sufficient financial resources (e.g. Ala-Mutka, 2004). Organic growth for a company means that sufficient capital needs to be available to establish a company and bring it to a level where it can sustain itself through its own revenues. These revenues can then be partly reinvested into the company to expand its operations. A simple example for this could be a restaurant or hair studio. If there is no external support anymore once the restaurant has opened and first paying customers, the company can be said to be growing organically. The business idea is the seed of the venture, and the initial capital required to start the company is therefore referred to as seed capital. High-growth companies on the other hand often do not and often even cannot follow such a straightforward growth pattern. For example if the development and marketing of a product needs to outpace that of a competitor to gain significant market share, the company cannot be patient to wait for organic growth. In other words, by the time a company has organically grown into a position where it is ready to launch the product to the market, the market window might be already closed, or a competitor will have captured the market (Rasila, 2004). Another factor limiting the usefulness of an organic growth approach is that for many companies, the upfront costs of the product development are so high, that it exceeds the means of the entrepreneur. Therefore, different measures need to be taken to enable or speed up the different growth phases of such a venture. This often involves one or several additional investment rounds. Different growth patterns and financing approaches of high-growth start-ups are introduced following. Figure 1 is an attempt to visualizes the growth patterns of organically growing company and a high-growth company.

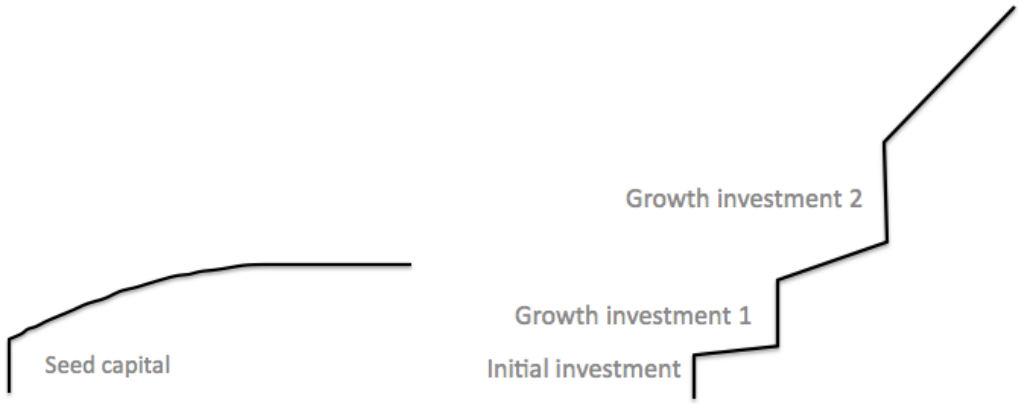

Figure 1. Organic versus high-growth pattern.

One approach to overcome this miss match of available funding and needed resources is proposed in this thesis as Business Model Evolution. The idea behind this approach is to sub-divide the development of the product into smaller sub-projects. These subprojects are much less elaborate than the whole product development, and therefore less expensive. The goal is to design each sub-project in such a way, that it can be covered by the financial possibilities available to the

company at that particular stage. These sub-projects are designed in such a way, that the resulting product of each sub-project, though still far from the final anticipated product, can be marketed already on its own. Because of the several versions of the product, also a suitable way of marketing such a product has to be found at every stage of the development. In other words, because the product comes in different versions, also the business model around it has to adapt. Following, this approach is called business model evolution.

Dividing the development of a service into several stages usually happens naturally, when a company is once established, and then sees how to expand their service. For Ovelin, the case company of this thesis however, the long-term vision was established beforehand, and intermediate steps in-between were artificially designed. Usually companies are forecasting the future step by step to understand where a company is going to be in the future. However, in order to plan for a large vision to become reality, one-way would be to back-cast from the wanted future state to the current state. In other words, one can look at the wanted outcome and try to estimate what intermediate steps would have to be taken in order for the wanted end-result to become a reality. The difference between forecasting and back-casting is shown in Figure 2.

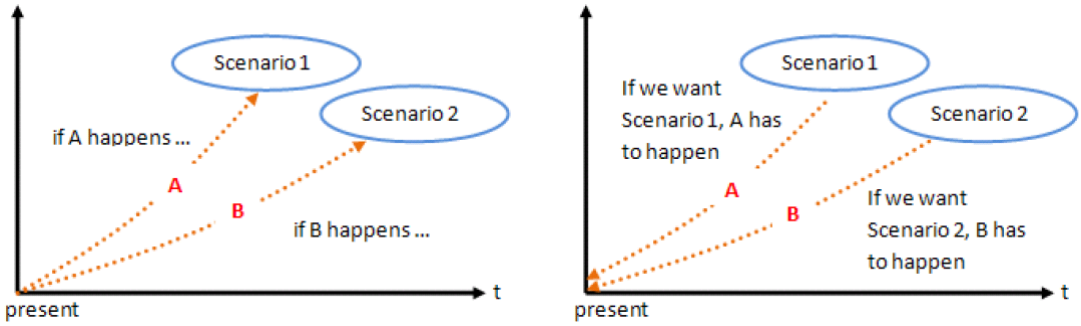

Figure 2. Forecasting (left) versus back-casting (right).

Since no comparable approach was found in literature, a theoretical framework was developed in the course of this thesis. The goal was to find ways for building an extensive product like the one envisioned by the case company, which could be executed by a start-up company with limited access to financial resources. The search for a solution lead to the framework of Business Model Evolution proposed in this thesis. It combines back-casting technique with Osterwalders well known Business Model Ontology. However, before introducing the Business Model Evolution framework, the service envisioned by the case Company Ovelin is described next.

1.2 MUSIC LEARNING GAME

Ovelin is a Finnish start-up company with the goal to make the world a more musical place. The aim is to make the hobby of playing a musical instrument accessible to people whom either lack the inner motivation to practice in the boring early phase of playing an instrument, or who cannot afford private lessons. Therefore, the company is developing interactive music games that can be played with real musical instrument. In other words, Ovelin's games combine the addictive features of computer games with music instrument exercises, so users get "hooked" to practice on their instruments. Using high-tech audio signal processing technologies, the games can be played with any normal (acoustic or electric) instrument, and do not require any special equipment other than a computer, or mobile device with a (usually built-in) microphone. Furthermore, incentives and motivating features used in computer games are utilized in Ovelin's products to keep the user motivated during a time when the exercises themselves may not yet bee motivating enough for many users to keep up their practices.

The idea of making a computer game to assist music instrument learning has its roots already in 2008. In a software business course at Tampere University of Technology, the students were asked to come up with business ideas to write a business plan. The author of this thesis had the idea of using the addictive features of computer games and social networks for the development of a skill that would endure over the lifetime of those particular games and platforms. The author of this theses proposed that such addictive features could be used in any sort of education, and a student project focusing on music instrument learning was proposed to the rest of the team. One of the reasons why learning to play a music instrument was chosen is, that like in the majority of video and computer games, playing an instrument is at least in the first phase practicing a motor skill. In other words, a user has to repeat a certain movement with his hands over and over again, until it becomes tacit knowledge. Focusing on a piano learning game, a business plan was developed for an imaginary company called Myzart. However, after the course ended, the idea was put to ice, as studying pressure was high, and the other two students of the team were not interested in taking the project further. It was over a year later, in the end of 2009, when the "inventor" talked about the idea to yet another student, that it was decided to go a step further and analyze the business potential of the idea. The two students initiated a project named StarEyes in the end of 2009.

The two main targets of StarEyes were to evaluate the feasibility of such a technology, while at the same time searching for a suitable way to fund the development of the project. Initially the project was mainly financed by the students, but also received minor financial support from the university. The technical feasibility was investigated in collaboration with the Audio research group of Tampere University of Technology and Wavesum Oy, a technology

provider specialized in signal processing and music content analysis. The study revealed that the recognition and analysis of polyphonic audio signals can be realized with sufficiently high accuracy and speed and therefore implemented in a game such as the one envisioned in the StarEyes project. Getting all the technologies, technical implementations, contents and partnerships in place means to overcome an enormous number of hurdles of business and technology. In practice, the realization of the StarEyes vision would have required much capital, an enormous amount of work in different fields, and carried technical, and especially high financial risks. Therefore, the second part of the project was to answer the question of how the development of such a product could be financed by a startup with very little financial resources.

The only capital the two had at that point were 20€ prize money from a course at the University, and the 2500€, partly out of a student loan, required to officially register the company. Furthermore, the two did not have the needed experience and knowledge in programming, music education, game design, audio technology other relevant areas. Being a digital product, StarEyes would have many of the benefits, such as ease of distribution and low reproduction costs. However, at the same time digital products suffer from these supposed benefits because of illegal copying, the reluctance of people to pay for pure digital products and other reasons. At the same time, the team projected that the implementation of the product will require enormous financial resources. Also, it became clear quickly that it is rather difficult to find an investor that is willing to invest so much money for a company with little development done, and with a business idea containing high risks. Therefore, the team analyzed if it was possible to develop a basic, much less elaborate product first, in order to prove the concept. It was found that not only is it possible to develop such a scaled down product, but there might already be a base of potential customers for this early version. Therefore, the question of how to market that early product had to be answered too, and a plan of how to continue from that product to the envisioned final product had to be developed. In order to systematically answer these questions, the department of Industrial Management of Tampere University of Technology was approached, and the process for writing this thesis was started.

The idea was born to sub-divide the development of StarEyes into several smaller sub-projects, each resulting in a scaled down, yet usable product. For each of these scaled down products, a business model was outlined, which allowed the product to be realized and brought to the market with the available funds at that time. This approach was termed “Business Model Evolution” with reference to Charles Darwin’s theory of evolution by natural selection. Just like the development of complex organisms in nature happens through several incremental steps, the development of a complex product like StarEyes might be able to “evolve” in a similar fashion.

1.3 OBJECTIVE

This thesis contains a development plan for a star-up in an extremely detailed form. It describes how at that point in time the development of Ovelin was seen to be most likely successful. Furthermore, it contains a framework of "Business Model Evolution" that proposes one possible way how a start-up company with very limited funds can develop both the company and the product over several stages rather than in one step. In other words, the objective of this thesis is…

> … to discuss the need to break ambitious business models by back-casting into a systematic, evolutionary processes to attract capital investors in each stage of the evolution of the business

In other words this thesis will (1) introduce business model evolution framework used for attracting different types of capital investors depending on the stage of the evolution and discuss (2) how it was used to build the business model for Ovelin as well as analyze (3) what role such deliberate breakdown of business model played in attracting capital investors.

For the theoretical background a literature review is given focusing on three key areas relevant for the thesis: (1) the development of growth ventures, (2) the characteristics of digital products and (3) business models. The concepts and Models found in the literature are thus used as building blocks for the theoretical framework "Business Model Evolution". This framework is then used in the Ovelin case to understand the planning of a capital investment strategy for a product like StarEyes. After that, the strategy was executed to build the first phase towards StarEyes, at which point a major Venture Capitalist came onboard to finance the full development of the envisioned product.

To compare the planned and executed development of Ovelin, the major milestones of Ovelin in these 2 years are outlined, and a current state of affairs is given. In this chapter the actual comparison of planned and executed development is written down.

1.4 RESEARCH METHOD AND PROCESS

The research method chosen by the researcher depends strongly on the nature of the research. Gummesson (1999) suggests five different data gathering methods that are typically used in management research. Data can be obtained from existing material, surveys, interviews, observations and action research. Surveys are often conducted to gain representative data on people's opinions to the investigated topic, whereas interviews are used to obtain in depth, often expert knowledge. The observation method is used when the behavior of a person in a certain context or

situation is of interest. Finally, action research takes place when the researcher himself is involved in the process under study and thus influences the result or outcome.

This thesis is best described as a longitudinal study conducted in action research. As shown in Figure 3, the process was iterative and involved both theoretical and practical work.

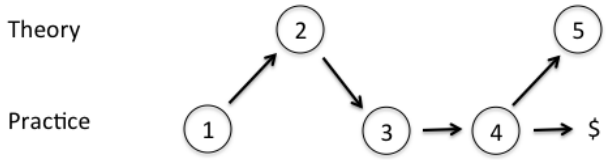

Figure 3. Visualization of iterative research process.

The research process is described following. The idea of StarEyes was created, and an ambitious business plan was written (1). However, the team realized fast that it would not be able to attract sufficient funding to finance the venture. In order to overcome this problem, the team decided to cut the development project into smaller pieces, and thus the required capital. This idea seemed very interesting not only for the venture, but also as a research topic. Thus, a theoretical model was built, that describes the process of dividing a business idea into different development and financing stages (2). This model was termed Business Model Evolution and attempts to let start-ups plan their capital investments strategically. The then formalized strategy was then taken and applied in Ovelin (3). Indeed, Ovelin was able to attract funding from several different sources and thus build a first version of its product (4). While several points in the strategy did not work out the way they were planned, the overall idea was successful. In practical terms, Ovelin was able to bring a major venture capitalist on board ($). The last part of the research project was then to compare the planned strategy to the actual development within Ovelin, and to discuss the usefulness of the Business Model Evolution process in practice.

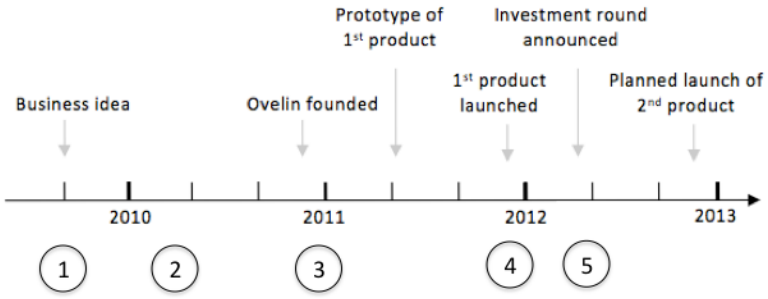

Figure 4. Timeline of development of Ovelin and research process for the thesis.

Figure 4 shows the timeline of the development of Ovelin in the early stage, and how the research process for this thesis was distributed over time.

2 DIGITAL PRODUCTS

2.1 E-BUSINESS AND E-COMMERCE

The introduction of information and communication technology (ICT) had and has a profound impact on the business environment. It changes old business models, cost structures and completely rearranges links among buyers, sellers as well as the boundaries of whole supply chains, and partner networks. ICT has changed the landscape of business in many ways. New industries, companies and products are available today that were unimaginable before. Furthermore, also many traditional industries have undergone immense changes, while for some products the basis of their existence was removed, questioning entire industries and forcing companies to reinvent themselves in order to find new ways of competing in the market place.

To highlight the application of electronic means for business, the prefix "e" is used for many technical and business terms. Electronic business and electronic commerce, commonly referred to as e-business and e-commerce, are buzzwords that are often confused and used interchangeably. Usually e-commerce refers exclusively to buying and selling products and services online, and may be considered the selling component of e-business (Farhoomand, 2005). E-business on the other hand can be understood as a wider term that simply stands for the conduct of business on the Internet (Osterwalder, 2010). E-business is also seen as a third phase, succeeding the two previous e-commerce phases (Kalakota and Robinson, 2000) as shown in Figure 5.

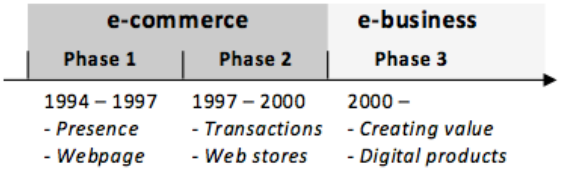

Figure 5. Phases of e-commerce and e-business (adapted from Kalakota and Robinson, 2000).

Phase one of e-commerce was about presence on the internet (1994-1997). Phase two was about transactions, the buying and selling of products over digital media (1997-2000). Typically, e-commerce technology is characterized with a list of seven unique features that have impacts on the business environment. These seven features are ubiquity, global reach, universal standards, richness, interactive, personalization/customization and information density as shown in Table 1. Phase three called e-business, includes all applications and processes enabling a company to provide business transactions.

Additionally to the e-commerce elements, e-business includes both front- and back office applications that form the core engine for modern business (Kalakota and Robinson, 2000). In other words, e-business is described as the application of information and communication technologies in support of all the activities of business. However, a multitude of definitions and descriptions exist for both terms, and a lot of disagreement exists when it comes to defining e-commerce and e-business (e.g. Bidgoli 2002, Laudon & Traver 2001, Farhoomand 2005,).

Table 1. Seven unique features of e-commerce technology (adapted from Kenneth and Traver, 2003).

Feature	**Description**	**Selected impact on business environment**
Ubiquity	Available anywhere, anytime	Altering industry structures by creating new marketing channels and expanding size of overall market. Creates new efficiencies in industry operations and lowers costs of firms' sales operations. Enables new differentiation strategies
Global reach	Crosses national and cultural boundaries	Altering industry structures by lowering entrance barriers but greatly expands market. Lowers cost of industry and firm operations through increased production and sales efficiencies. Enables competition on global scope
Universal standards	All applications follow the Internet standards	Altering industry structures by lowering barriers to entry and intensifying competition within an industry. Lowers costs of industry and firms operations by lowering computing and communication costs. Enables broad scope strategies.
Richness	Different forms like text, video, audio	Altering industry structures by reducing strength of powerful distribution channels. Changes industry and firm operations costs by reducing reliance on sales forces. Enhances post-sales support strategies.
Interactivity	Customers engage in creation and purchase process	Altering industry structures by reducing threat of substitutes through enhanced customization. Reduces industry and firm costs by reducing reliance on sales forces. Enables Web-based differentiation strategies
Personalization/Customization	Targeting messages to intended audience	Altering industry structures by reducing threats of substitutes, raising barriers to entry. Reduces value chain costs in industry and firm operation costs by lowering costs of obtaining, processing and distributing information about suppliers and consumers.
Information density	Costs for information search reduced, quality of information improved	Altering industry structures by weakening powerful sales channels, shifting bargaining power to consumers. Reduces industry and firm operations costs by lowering costs of obtaining, processing, and distributing information about suppliers and consumers.

Interestingly, definitions of e-business and e-commerce usually do not include any reference about the product or service offered by the organization. In other words, any organization that utilizes some information technology, for example in the form of a web-page or web-store, can, at least to a certain extent, be regarded as conducting e-business and e-commerce. This was also noted by Osterwalder who

described the "e" in e-business model as a temporary phenomenon that will disappear in time because most business models will eventually involve some ICT component (Osterwalder, 2010).

However, a typical way to distinguish different forms of e-commerce is by analyzing three parameters of how an organization utilizes electronic means to supply its products to customers:

- transaction process
- delivery agent (or intermediary)
- product

All three parameters can be either physical or digital. While physical transaction can be seen as paying in the shop with cash, or possibly some barter on a market, digital transaction means utilizing electronic representation of money through the use of a credit or debit card, either in the shop or through the internet. As was argued before, the digital form of the transaction process can be said to be the essential attributes of early e-commerce. The delivery agent or intermediary is the channel through which a product is distributed to the customer. This can either be in physical forms, for example through shops or postal services, or in digital form as email attachments or downloaded from the internet. While the delivery agent for virtually all physical goods is physical, many digital products these days are delivered digitally.

Finally, also the product itself can be in physical (or intangible without digital existence, such as an insurance) or digital form. While certain products, for example utensils can only exist in physical forms, others, such as computer games, can only exist in digital forms. However, there are also products that can exist in either forms, for example a book can be read digitally with a (physical) piece of equipment, or in physical form as classical book. The distinction between digital or physical occurrence of the three parameters leads to eight possible modes of commerce as shown in Figure 6.

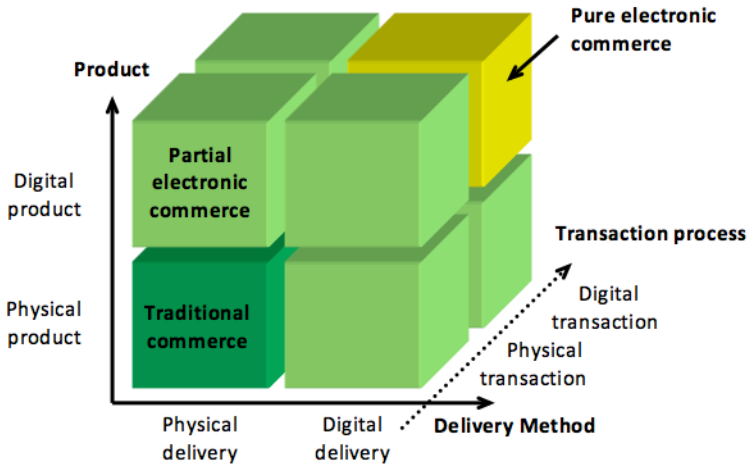

Figure 6. Pure versus partial e-commerce.

Based on this model, the modes of commerce can be divided in to three groups:

- Traditional commerce: All dimensions are physical
- Pure electronic commerce: All dimensions are digital
- Partial electronic commerce: All other possibilities including a mix of digital and physical dimensions

Traditional commerce is still very dominant today as it represents the majority of classical stores. Also pure e-commerce is becoming more common, with the increasing popularity of digital products such as music in digital form, movies on demand, games, digital books, newspapers and so on. Finally, while some modes of partial e-commerce are very common, others are not possible. The distribution of physical products (matter) in digital form is not possible as such. However, with the emergence of 3D printing, this will eventually also be a very disruptive business option (Savitz, 2011). This will be discussed in more detail in the next chapter. In Table 2 examples of different modes of e-commerce are given.

Table 2. Examples of traditional commerce (top), and pure (bottom) and partial e-commerce (in between).

Transaction	Delivery	Product	Example
P	P	P	Brick and mortar shop, e.g. Wal-Mart
P	P	D	Software or game store, e.g. computer game stores
P	D	P	not possible
P	D	D	Voucher of prepaid services, e.g. gift cards for ITunes
D	P	P	Online shops, e.g. Amazon
D	P	D	Online shops, e.g. online computer game stores
D	D	P	not possible
D	D	D	Online shops for digital products, e.g. eBooks store

As was mentioned previously, the vast majority of businesses utilize electronic transaction in one form or another. In other words, the relevance to distinguish between different modes of e-commerce based on the transaction attribute is rather low. Therefore, the following discussion shall focus more on the two other attributes. First, a discussion of digital products, and second the digital delivery of products.

2.2 E-COMMERCE VS. DIGITAL PRODUCTS

As became clear in the previous sections, digital products have certain attributes to them that make them different to physical products, much like e-commerce has unique features compared to traditional commerce. However, while the seven unique features of e-commerce are often discussed (see Table 1), a comparable discussion about digital products is yet missing. The discussion about digital products is usually linked to the effect on the business model (or more revenue models). As the digital nature of these products has a significant influence on the revenue models, this focus is understandable. However, as will be shown in the discussion of the Business Model framework by Alexander Osterwalder, the revenue model is only one part where the digital nature of the product may have an influence. In other words, while the interest of scholars in digital products is still rather high, no thorough discussion of the characteristics of digital products was found in the literature yet.

By July 2010, Google Scholar search revealed 159 hits for scholarly journal articles containing the keyword digital product in the title, and 5210 containing the keyword in the text. Figure 7 shows the development of the occurrence of the keyword "digital product" in the text of scholarly articles since 1992.

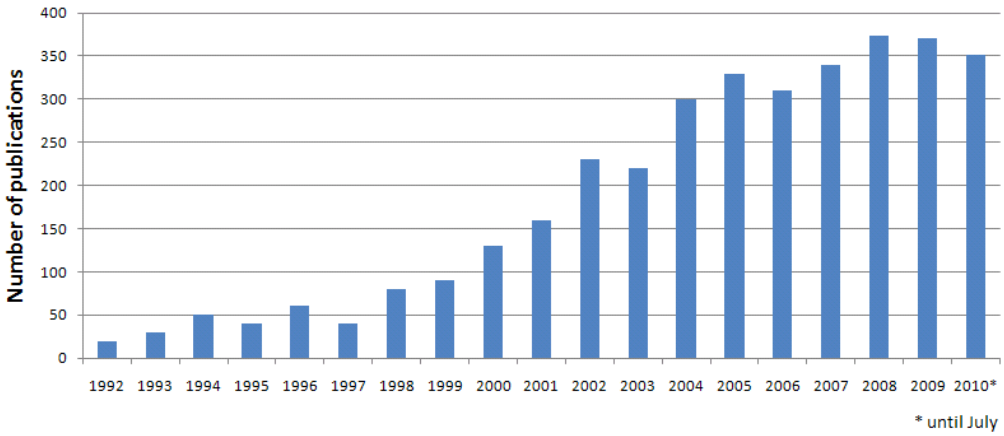

Figure 7. Development of occurrence of scholarly articles with keyword "digital product" in the text (1992- July 2010).

Scholars usually approach the topic of digital products from two sides. Either the discussion is about technical aspects of digital products such as protection of digital products form piracy or other specific fields like digital product modeling (e.g. Voyatzis, 1999; Meier, 2001). The second side discusses digital products from a business perspective, where the interest is to identify how the revenue logic changes because of this new technology (e.g. Schneider, 2005). The latter often suggest that different strategies from those used by sellers of physical products have to be adopted, to ensure that a revenue stream flows. Their focus on revenue may be one reason why the characteristics of digital products are usually not stated, but rather translated directly into a list of features that characterize e-commerce. As shown in the previous chapter however, also elements of a business model other than the revenue model may be changed for digital products. To fill this void, a list of distinctive characteristics of digital products is compiled and thoroughly discussed following.

One attempt to identify digital products included four characteristics (Schneider, 2005). These characteristics are meant to distinguish digital products form physical products or intangible products without a digital existence. They include:

1. High fixed costs to produce the first unit, but low marginal costs to produce subsequent units,
2. Quality is difficult to judge without actually experiencing the product,
3. Capacity constraints do not limit production output in any significant way, and
4. Storage, retrieval, and forwarding the product is easy and inexpensive to do.

However, while these four characteristics certainly highlight important aspects of digital products, they are not really characteristics of the product itself. These four characteristics rather describe the business aspects of e-commerce technologies. For example, high fixed cost to produce the first unit does not only denote a characteristic of digital products. Also many physical products cost a fortune during the development phase, while the product itself is in the end comparably cheap to reproduce. For example the Mach 3 shaver of Gillette cost the company an estimated 750 million dollars (Aoki, 2003) to develop, while the reproduction costs are relatively low. On the other hand, taking a digital picture, which is also a digital product, can be rather cheap. While it is true that the development of many digital products cost a lot, high development costs are not a characteristic for digital products. On the other hand, with reproduction costs essentially zero, this characteristic certainly distinguishes digital products form physical products. With this in mind, the third characteristic, regarding capacity constraints not limiting production output, is actually redundant to the first characteristic.

A second example of how the previous four characteristics do not actually describe only digital products is the second statement. The quality of many physical

products too is difficult to judge without actually experiencing the product. Using the Gillette example again, who can judge the quality of a shaver without actually using it? The difference with digital products is again, that reproduction costs are low, and not limited to the producer. In other words, any user can usually reproduce the digital product without the need of special equipment. Furthermore, the reproduction of a copy does not degrade in value. In other words, each copy is as good as the original. If a publisher sends someone an eBook to test, the receiver can use this copy without returning it, or just return yet another copy. However, one could send just a preview of a few pages, as for example Amazon does. Then the customer can decide whether he likes the product or not. Therefore, the option of easily giving test-samples exists because of the products granularity and ease of access/delivery rather than the judgment of the product only being possible after use. In other words, often it is possible to test a digital product with limited functionality or limited content (or both). Therefore, companies can offer a "preview" to test of the product without actually giving away the whole product. Due to the ease of access, the customer can easily purchase the full version through the Internet.

Schneider formulated the characteristics of digital products in such a way, because he is analyzing different revenue models for digital products, rather than business models. In order to discuss revenue models, Schneider used the four characteristics to excerpt two consequences for business with digital products:

1. the unauthorized use of the product can be difficult or impossible to control by the sellers
2. sellers of digital products must adopt different strategies from those used by sellers of physical products

Out of these consequences, Schneider then presents eight different revenue models for digital products. However, as will be discussed following chapter, the revenue model is only one element of a business models. Therefore, other characteristics of digital products may be of interest too, even if they do not affect the revenue model.

2.3 Analyzing Characteristics of Digital Products

As was argued before, Schneider actually describes e-commerce technology, rather than digital products with the four statements. However, as the discussion about the costs of first unit production and subsequent unit reproduction showed, discussing unique features of e-commerce can help identifying some of the characteristics of digital products. Therefore, the seven unique features of e-commerce are examined following in order to identify distinctive characteristics of digital products. A

stripped-down version of the seven unique features of e-commerce technology can be found in Table 3.

Table 3. Summary of seven unique features of e-commerce technology.

Feature	**Description**
Ubiquity	Available anywhere, anytime
Global reach	Crosses national and cultural boundaries
Universal standards	All applications follow the Internet standards
Richness	Different forms like text, video, audio
Interactivity	Customers engage in creation and purchase process
Personalization / Customization	Targeting messages to intended audience
Information density	Information search costs reduced, while quality improved

First, ubiquity for e-commerce means that the product or service can be purchased at anytime and anywhere as long as there is internet access. In other words, a web store has no opening hours and is thus always available if the internet is accessible. As was argued in the previous chapter, this is the case already in many countries in the world. Furthermore, the increasing popularity of internet enabled smart phones will further foster ubiquitous reach to a 24/7 access at virtually any place on the planet. Ubiquity of course has an even more profound impact on the sales of digital products. While it may take some days to receive a book ordered from Amazon, an eBook can be delivered instantly. With regard to the characteristics of digital products, not only their sales is ubiquitous, but also their usage. One can access emails at any time and place, and online database services like Wikipedia do not have restricted access hours like libraries. However, ubiquity is a consequence of two characteristics of digital products: the ease of transmission, and the ease to reproduce, store and retrieve digital products. When using water as an analogy for a digital product, ubiquity is the consequence of ease of transmission (given a suitable distribution network), and the ability that it can be stored easily (central and/or local). Copying water like a digital product is of course not possible.

However, with regard to ubiquity, another analogy between water and digital products is emerging. While hot water used to be produced and stored locally in boilers in each house, many houses in cities are today connected to a central hot water supply as they are to a cold water supply. In other words, the water is heated and stored central, and made available in individual households on demand. Similarly for digital products, applications and documents are going to move from the desktop into the cloud (Miller, 2009). Cloud computing allows applications and files to be hosted on a "cloud" consisting of thousands of computers and servers, all linked together and accessible via the Internet (Miller, 2009). Cloud Computing refers to both the applications delivered as services over the Internet and the hardware and systems software in the datacenters that provide those services, 2010).

Perhaps the most noticeable company currently embracing the cloud computing model is Google (Miller, 2009). Google is offering a large collection of web-based applications, such as word processing, presentation software, email, or calendar, all served via its cloud architecture. Furthermore, cloud computing enables Google to include functions that are not easily possible with desktop based applications, such as co-editing of a document by many people at the same time. Ease of group collaboration is only one of the many advantages of cloud computing. However, next to the advantages, there are also some disadvantages as shown in Table 4. The table has been adapted from Miller (2009), and contains technical as well as business advantages and disadvantages.

Table 4. Advantages and Disadvantages of cloud computing (adapted from Miller, 2009).

Advantages	**Disadvantages**
Lower-cost computers for users	Requires constant internet connection
Improved performance	Low-speed connection may be insufficient
Lower IT infrastructure costs	Can be slow
Fewer maintenance issues	Features might be limited
Lower software costs	Stored data might not be secure
Instant software updates	Lost data in cloud not retrievable
Increased computing power	
Unlimited storage capacity	
Increased data safety	
Improved compatibility between operating systems	
Improved document format compatibility	
Easier group collaboration	
Universal access to documents	
Latest version availability	
Removes the tether to specific devices	

As can be seen from this table, the advantages of cloud computing exceed the disadvantages clearly. Furthermore, factors such as the increasing speed and access to the internet from any place in the world will further reduce the impact of some of the disadvantages. In other words, cloud computing is likely to become the dominant process in information and communication technology. Or as Miller puts it: "It's the technology of the future, available to use today" (2009). This will not only have serious consequences for software developers and hardware producers, but, as is argued in this work, also on business models.

While ubiquity itself is not a characteristic of digital products, the discussion about it has revealed two distinctive characteristics of digital products:

- the ease of reproduction, storage and retrieval of digital products, and
- the ease of transmission of digital products through telecommunication networks or hosting them centralized through cloud computing.

Second, global reach is obviously one of the main advantages of ubiquity for e-commerce, because a much bigger market can be reached with a similar product. However, this is not a specific characteristic of digital products, but again a consequence of the two characteristics previously discussed with regard to ubiquity. Compared to physical products, many digital products are not specifically targeting to incorporate local or cultural differences. In many cases, only the language of the product is changed to the local language, while the rest of the product is the same in all markets. One reason for this may be that digital products are rather new and therefore often the first version introduced establishes a dominant design in any cultural background. Nevertheless, even if certain aspects of a digital product are adapted to better suit certain cultural surroundings, this is usually not changing the digital product too much. In other words, the work to specifically target a certain market is often not part of the core competence of a company and is therefore often outsourced to a so called localization company. In any case, the same two characteristics of digital products that enable ubiquity also enable global reach. Using the same analogy of water, global reach describes the reach of the water supply system, not the water itself.

Third, universal standards are, similarly to global reach, not characteristics of digital products, but rather prerequisites to enable ubiquity and global reach. In other words, these universal standards allow digital products to be ubiquitous and have global reach. Thus, they are characteristics of the distribution system, rather than the product. In the example of water, universal standards are like the adapters and connection bits of tubes and appliances which make it certainly easier to connect all parts to the water supply system. But again, universal standards do not describe the water itself.

Fourth, richness of e-commerce means that the companies can use several formats to represent the digital product. These formats include text, graphics, pictures, audio, video and animations. As was discussed before, the amount of formats is likely to increase in the future to address different senses too. The analogy with water does not work very well, because the form of reproduction of water is up to the user. In other words, the transmitted water is not predetermined to be reproduced as drops, jet of water or spray. Nevertheless, one characteristic of digital products can be described as richness, meaning that there are very many formats that can be utilized, enabling very versatile products. These formats include texts, audio, video, animations and others. For further use, the inclusion of various formats to represent digital products is called richness.

Fifth, interactivity in e-commerce means that the sales process is in cooperation with the customer, without the eminent requirement of a sales force. In other words, the customer is much more involved in the ordering process. A web store can for example guide the customer through a purchase by asking questions and successively refining the offered product. However, whether or not such a sequence qualifies as interactivity is questionable because interactivity can involve much more than the output of certain data based on the specific input data. There is an ongoing debate on what is interactivity. The contingency view of interactivity for example, discusses interactivity in three levels (Rafaeli, 1988):

1. Non-interactive, a message is not related to previous messages
2. Reactive, a message is related to one immediately previous message
3. Interactive, when a message is related to a number of previous messages and to the relationship between them.

Interactivity has been defined as "an expression of the extent that in a given series of communication exchanges, any third (or later) transmission (or message) is related to the degree to which previous exchanges referred to even earlier transmissions" (Rafaeli, 1988). In other words, a reply of the system depends not only on the immediate input, but also on previous "knowledge" the system has about the user. For digital products interactivity means that they can accept and respond to inputs from users on a continuous basis. In other words, digital products can "answer" to the users perpetually. Examples for non-interactive process are programs that operate without human contact, for example compilers that transform source code written in a programming language into another computer language to create an executable program. An example for a reactive process is pressing the italic button in a word processor. The program will change those words into italic that were marked before. Examples for interactive digital products are computer games, where a constant interaction between user and product occurs. The user inputs a message through for example the game controller, whereas the game "responds" through for example visual means. Depending on whether Super Mario ate an invincible star previously, he or the turtle will die after a collision. Thus, one characteristic of digital products is, that they can be reactive or even interactive.

Sixth, personalization/customization in e-commerce means that a customer can be served rather individually. In traditional commerce, this enables for example targeted online advertisement. However, compared to physical products, digital products can often be tailored to the specific user's preferences rather easily. Certain features of a computer program for example can be made available and settings and preferences can be altered by the user. In computer games, the difficulty level can be changed to meet the skills of the user. This customization is usually chosen and activated by the user himself and does not require additional effort from the developers of the digital product. Note: making these options available in the "first" unit does usually require effort from the developers, but each subsequent unit has this customization options built in automatically. While certain

physical products can be customized too, this is usually more intricate, and a certain effort has to be made for each subsequent unit. One additional characteristic of digital products related to personalization/customization is machine learning, which is discussed following.

Machine learning is related to other scientific disciplines such as artificial intelligence, pattern recognition and data mining. In this context, learning "denotes changes in the system that are adaptive in the sense that they enable the system to do the same task or tasks drown from the same population more effectively the next time" (Michalski, 1994). In other words, algorithms can be improved by learning from large amounts of data. This data can come for example from sensors or databases. Due to the advancement of technology, it is possible to capture and store vast quantities of data, find patterns, trends and anomalies in these datasets and summarize them with simple quantitative models (Witten and Frank, 2005). While data mining denotes the extraction of implicit, previously unknown, and potentially useful information from data, machine learning can be seen as the technological basis or tool for data mining (Witten and Frank, 2005). Therefore, machine learning allows algorithms and thus digital products to gain improved functionality through use. In other words, when utilizing machine learning properly, the more a product is used, the better it becomes. For example, the Google search form suggests keywords while they are typed into the search field, as shown in Figure 8. In other words, the Google search algorithm may have already some idea of what keywords a user may be looking for, based on the millions of previous users searching for similar keywords.

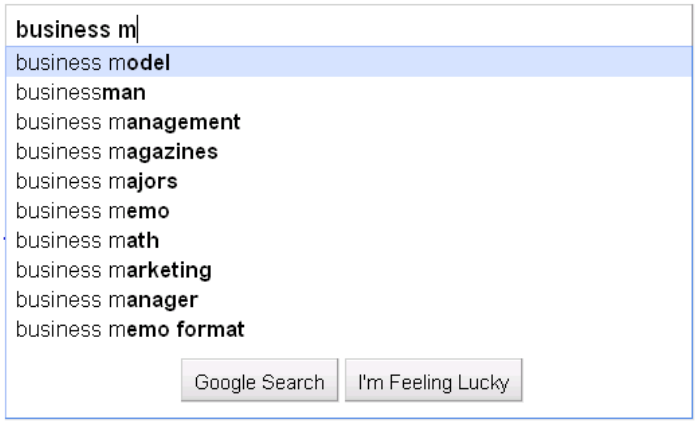

Figure 8. Keyword suggestion in Google search engine for "business m…".

Other contemporary examples of machine learning are friend suggestions on Facebook, auto correction in word. Furthermore, services based on recommender systems like the internet radio Last.fm or movie recommendation search engine Jinni highly encourage their users to contribute with information and their opinions about songs and movies respectively. As a consequence, the algorithm of these products can suggest users movies they may like based on the preferences of a

large pool of data from users with a similar taste. Therefore, the users of these services actually create a significant portion to the customer value.

Seventh, information density is an advantage for e-commerce, because the search for information is easier and usually yields much more information than traditional means of commerce. A person in a bookstore for example may not know much more about a certain book, while in web stores like Amazon there might be summaries, critiques, related book suggestions and even prize comparisons for different sellers. It is important to note that information density does not simply mean more information, but rather the right information at the right time, with the possibility to investigate further when there is an interest. However, information density again is not a characteristic, but rather a consequence of several other characteristics of digital products. Due to ease of transmission, and the ease to clone, store and retrieve digital products, sellers can easily accumulate information about their products and supply them to potential customers. Nevertheless, some additional characteristics of digital products are, as discussed following, related with information density. These characteristics concern:

- incorporation of external sources
- continuous extension
- continuous enlargement

Generally, the target of increasing the information density of a digital product is to make it more interesting or useful for the user. This is often not possible for traditional physical products. Nevertheless, also for certain digital products this may be more difficult than for others. As discussed in the in the previous chapter, the characteristic that describes the divisibility of digital products is referred to as granularity (Hui and Chau, 2002). However, for the later application in this work, a distinction is made between content granularity and function granularity. The distinction can be described with an analogy from psychology. In human resource management, the terms job enrichment and job enlargement are used to describe two possibilities to increase the motivation of workers (Herzberg, 1983 p. 440). While job enlargement means being in charge of a broader range duties and responsibilities, job enrichment gives more control and managerial access to perform tasks and responsibilities. In other words, job enlargement is horizontal, whereas job enrichment is vertical expansion of duties.

Similarly to job enrichment and enlargement, there are essentially two possibilities to make digital products more attractive to use. For digital products the terms extension and enlargement shall be used in this work. Extension in computer science means improving an application with a set of software components that add specific capabilities to it. In other words, more functions are made available in the digital product. For most digital products this usually comes in the form of updates and plug-ins that are continuously made available to extend the application. On the

other hand, enlargement refers to more content that is made available in a digital product. In other words, the user is given more or better information, rather than more functionality. As an example, adding a help function to a digital product can be seen as extension, while improving the help text is an enlargement.

Usually it is the same organization of a digital product that develops it and later extends and enlarges it. However, also external extensions and enlargements are possible. In other words, two parties may team up in order to mutually increase the value for their users. These parties can either involve other organizations, but also an unorganized user community.

For example, extending an application with plug-ins like the multimedia platform Adobe Flash enables the display of animations and videos in various applications of other developers. Another example is Google's product Ad Sense used throughout the internet to allow owners of a website to display advertisements and thus generate an income through Google. Extending an application is usually done on local devices like the computer and each user is responsible what plug-in are installed in his version of the application. However, if the application is made available online on demand through cloud-computing, extending an application does not require any effort of the user. When such an application is extended or enriched, this becomes available immediately to all the users. Users are usually informed upon features that newly became available, even through sometimes changes in privacy settings are insufficiently communicated (Facebook).

Enlarging a digital product with content of an external organization is possible too. Travel search engines like SkyScanner for example aggregate information from many other travel sites and helps users find and book flights. The search engine can therefore offer many more products at the same time which leads to a higher number of bookings and thus more booking fees. The travel sites from airlines on the other hand receive another sales channel. As indicated before, also an unorganized user community could be used to extend or enlarge digital products. Open source communities develop whole independent products like the operating software Linux, server software Apache, web browser Mozilla or applications like Open Office. Software developed completely or extended by user communities and later commercialized directly is called professional open source software (POSS). Nowadays, the enlargement of content through an unorganized user community is very common for content based services. Currently very popular services like Wikipedia, YouTube or Facebook are mainly based on the content, rather than the functionality. Interestingly the content for many of these successful social media is actually provided by the users for free. The creation of content by an unregulated user community has also been called cloud-sourcing in allusion to the term outsourcing (Lakshmanan, 2009).

2.4 Defining Digital Products

The previous discussion of the seven unique features of e-commerce can be used to analyze several characteristics of digital products. Accumulating these, the following nine distinctive characteristics of digital products are proposed as shown in the Table 5. This list is meant to give an overview of characteristics digital products can have. However, most of these characteristics are neither totally unambiguous nor independent form one another. While much care was taken to accumulate this list, the list may be extended with further characteristics, also depending on how digital products are defined. Therefore, the characteristics refer to the digital products as defined in the previous chapter. Furthermore, rather than trying to distinguish digital products from physical products, the list contains possible characteristics of digital products. In other words, not the requirements are listed for a product to qualify as a digital product, but rather possible options of digital products.

Table 5. Nine distinctive characteristics of digital products.

Characteristic	**Description**
Ease of reproduction, storage and retrieval	Digital products can be reproduced with virtually no degradation of quality (clone), while the reproduction is does not require any special equipment. Digital products can be easily stored and retrieved either on a local computing device or in the internet.
Ease of transmission / cloud computing	Digital products can be virtually instantly transmitted or accessed through telecommunication networks like the internet, with no constraints to time and space.
Richness	Digital products can contain information in various forms, such as text, audio, video, animations, and possible others (as discussed in chapter 3.3).
Incorporation of external sources	Digital products can be interfaced with external sources to mutually increase the value for the users of either product.
Continuous extension	Digital products can continuously be extended with external plug-ins to upgrade the functionality of the product.
Continuous enrichment	Digital products can continuously be enriched with external content (professional or voluntary) to increase the value of the product.
Interactivity	Digital products can accept and respond to inputs from users on a continual basis.
Customization / Personalization	Digital products often can be tailored to the specific user's preferences rather easily.
Machine learning	Algorithms and thus digital products can gain improved functionality through the analysis of usage.

Many of these characteristics have contributed to changing the realms of business lasting. Some traditional means of making a profit, for example through the sales of encyclopedia books, is no longer a profitable business. However, digital products created a multitude of new options to do business. This has usually been discussed from an e-commerce viewpoint where the revenue model was in the focus of interest. However, as the characteristics of digital product indicate, also other aspects of traditional business are touched and can be altered. In other words, several elements of a business model may potentially be altered. To understand on what elements of a business model are affected by the characteristics of digital products, the topic of business models is discussed in the next chapter.

3 BUSINESS MODELS OF DIGITAL PRODUCTS

3.1 OVERVIEW

The term business model is usually associated with the "new economy" (Boulton and Libert 2000) and gained popularity in the late nineties alongside terms such as e-commerce and e-business. With the spread of the internet, new ICT companies were expected to change the existing ways of doing business (Osterwalder et. al., 2010). Moreover, the distinctive characteristics of e-business allowing new ways of doing business that were expected to render existing business rules or even economic theories and laws obsolete (Merrifield, 2000). Economists envisioned a "Bertrand market", which describes an essentially friction-free marketplace (Bertrand, 1883). However, the initial huge expectations of the new economy were crushed when the so-called dotcom bubble burst in the end of the year 2000. Nevertheless, after the initial hype and the following steep decline of the industry, internet and ICT technologies have steadily grown since to become a major impact factor for most industries today. This development can be described according to the hype-cycle theory from the technology advisory firm Gartner as shown in Figure 9 (Linden and Fenn, 2003).

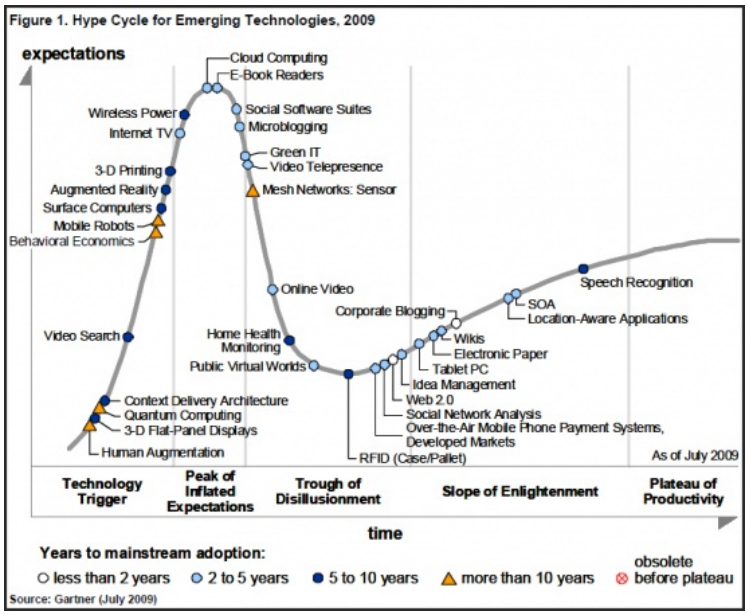

Figure 9. Hype cycle of the dot com bubble (adapted from Linden and Fenn, 2003).

One reason for the harsh drop may be attributed to the fact that many businesses during those days were trying to get as many users as possible without a sound plan regarding how to deliver what kind of value to the customers and how to earn money from them. In other words, entrepreneurs and investors were interested in large number of users and believed that a suitable way of generating a profit from it can be found once a large user base has been achieved. However, as many of them

later learned, generating a profit from a large number of users alone was not an easy task. Five examples of famous so called dot-com flops and sums invested in them are shown in Table 6.

Table 6. Famous dot-com companies that went bankrupt when the dot-com bubble burst.

name	Years	offering	Invested money
Webvan	1999-2001	online grocery store	$375 M
boo.com	1998-2000	online fashion store	$160 M
Kozmo.com	1998-2001	Store and delivery service (1 hour delivery)	$280 M
Flooz.com	1998-2000	Online currency as alternative for credit card	$35 M
kibu.com	1999-2000	Online community for teenage girls	$22 M

What the dot-com companies were lacking was a solid plan or even an idea of how the company is actually going to create a profit from the users. It was in this setting where the discussion about business models was picked up on a broader scale. Figure 10 shows the appearance of the term 'business model' in scientific articles.

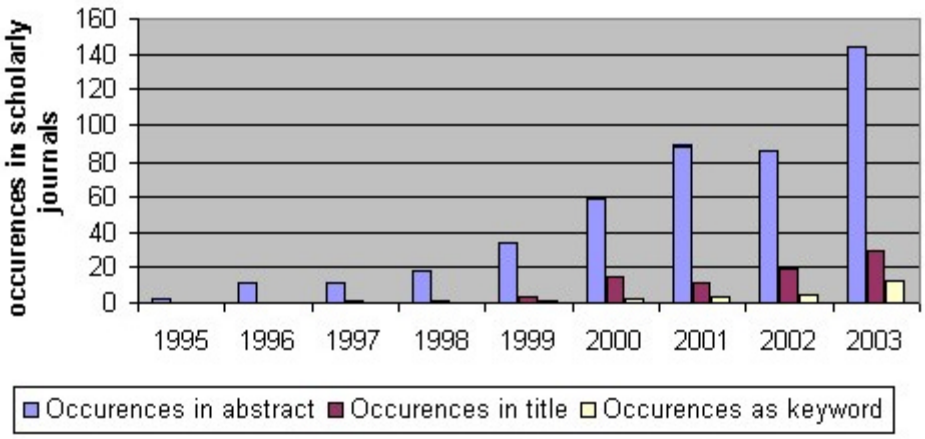

Figure 10. Appearance of term business model in academic articles.

However, in the early phase, the term was used rather arbitrarily. Academics, journalists and business people alike referred to business models while discussed anything related e-commerce, start-up and high tech companies (Osterwalder et. al., 2010). While e-business did not hold all promises it in the late nineties was attributed with, it did create many new options for managers in various fields. The internet opened up new ways of doing business with regard to pricing mechanisms, customer relationships, partnering and revenue sharing. According to Osterwalder, managers today are spoilt with options when defining their value proposition, configuring value networks, choosing partners and looking for new ways to reach customers. However, when confronted with numerous new ways in various aspects of business, managers may lose the overview. Therefore, term business model has been and is used to describe any aspect of a business and is therefore often misinterpreted or misunderstood.

A common confusion with regard to business models lies in the scope of the concept. While many people talk about business models, they really only consider a part of the business model (Linder and Cantrell, 2000). Osterwalder uses the example of online auction being a pricing mechanism rather than a business model (Osterwalder et. al., 2010). Similarly online communities, free trial periods for software or online help forums in itself are not a business model, but rather part of the customer relationship. In conversations, business models are also often confused with revenue models, which is again just one element of the business model. The revenue model of a firm can be understood as the logic behind the immediate exchange of money and product between customer and supplier. In other words, what a company actually sells. For example the revenue model of eBay may be described as charging a fee for connecting the seller of a product to the buyer. Obviously eBay needs to carry out many other functions than charging the connection fee in order to run its business. The previously mentioned pricing mechanism, customer relationship or revenue models describe but some of the important aspects of a business. However, in order to get a comprehensive picture of how a firm conducts business, one needs to describe a whole set of business aspects. Therefore, numerous academics attempted to describe and define business models in a more holistic way. As a result, a vast amount of theoretical models around the field of business model theory emerged. These frameworks may represent a suitable managerial tools to investigate all relevant business aspects and therefore overcoming the problem of a too narrow focus on one particular aspect.

Nevertheless, the focus of the proposed business model frameworks differs much between the authors. Malone et. al. for example distinguish between 16 different business models based on two dimensions (Malone et. al., 2006). The models is based on four basic business models what asset rights are sold (Creators, Distributors, Landlords and Brokers) and four variations of each based on what type of assets are involved (Financial, Physical, Intangible, and Human) as shown in Figure 11.

		What type of asset is involved?			
		Financial	Physical	Intangible	Human
What rights are being sold?	Creator	**Entrepreneur**	**Manufacturer**	**Inventor**	**Human Creator***
	Distributor	**Financial Trader**	**Wholesaler/ Retailer**	**IP Trader**	**Human Distributor***
	Landlord	**Financial Landlord**	**Physical Landlord**	**Intellectual Landlord**	**Contractor**
	Broker	**Financial Broker**	**Physical Broker**	**IP Broker**	**HR Broker**

* These models are illegal in the US and most places today because they involve selling human beings. They are included here for logical completeness.

Figure 11. Business models distinguished based on what rights are sold and what type of asset is involved (Malone et. al, 2006).

What makes this approach very nice and comprehensive is that the typology is very reliable and practical, and therefore suitable for large scale empirical studies which

they have performed. On the other hand, also Malone notes, that there is only one other large scale study made on the topic of business models. The absence of other large scale studies might indicate that the approach taken for this framework takes a rather superficial look on a much more complex topic. In other words, dividing business models according to those two categories might be useful for example for investors who are interested in what general type of business they should invest. However, to describe a business thoroughly, this framework is not the model of choice.

Another approach was presented from Linder and Cantrell (2000), who not only present a comprehensive approach to business models, but also look into the variation over time. Their business model approach can be seen in Figure 12.

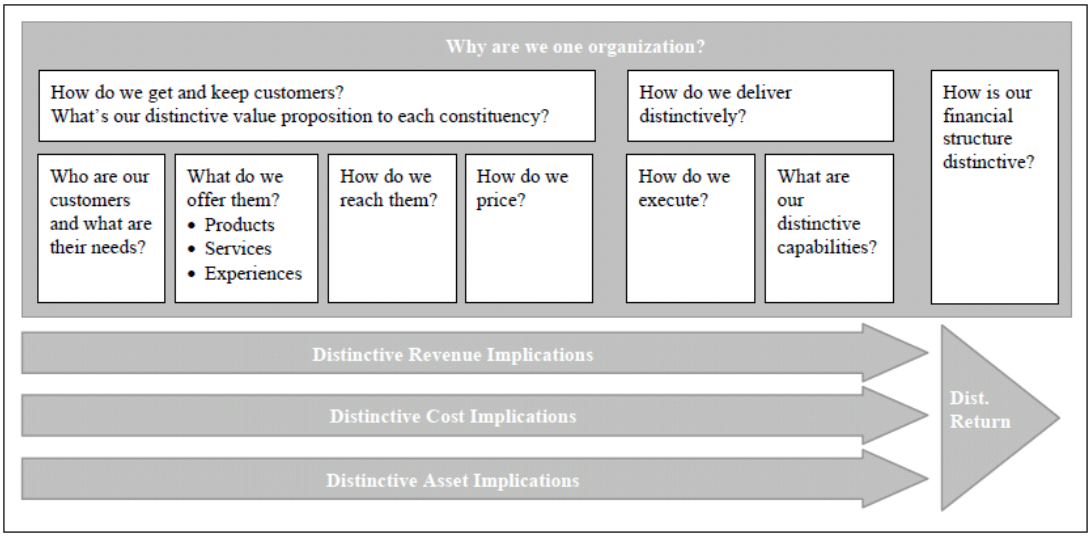

Figure 12. Business model concept by Linder and Cantrell (2000).

Linder and Cantrell's concept is somewhat similar to the one of Osterwalder (presented in more detail in the next chapter), and will therefore not be explained in more detail. However, their view of business models only being a picture at one particular point in time, and that it under constant change due to environmental changes like competition and technological advancements. The distinction is based on the degree to which the core logic of a company is changing, rather than into what it is changing. As shown in Figure 13 they identify four different models along the dimension of degree of change, namely realization models, renewal models, extension models and journey models.

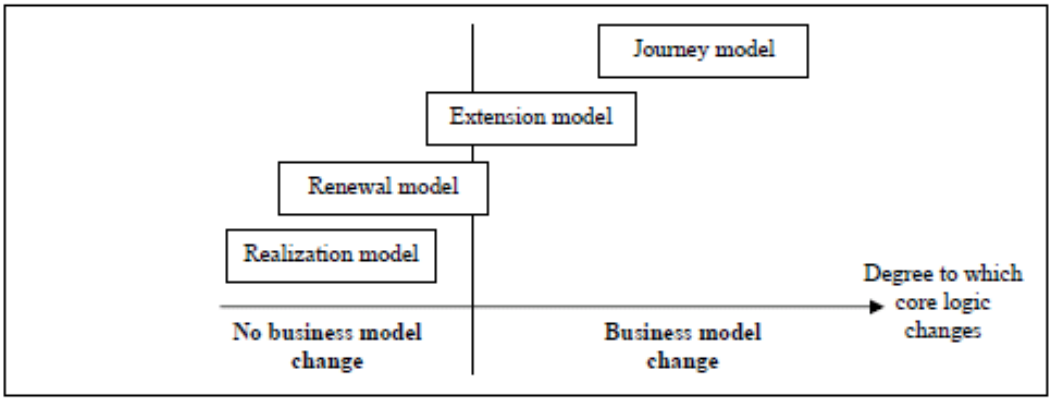

Figure 13. Change model (Linder and Cantrell (2000).

The realization model describes companies that only undergo minor changes in the existing business model, such as brand maintenance, product line extensions, geographic expansions or additional sales channels. The renewal model describes companies that leverage their core skills to create new positions on the price/value curve for example by serving untouched markets and introducing new retailing formats. The extension model characterizes companies that expand businesses to cover new ground, for example by including new markets, value chain functions, and product and service lines. Finally, organization described best by a journey models provoke most change and take a company to a complete new business model. While the business model concept of Linder and Cantrell will not be used in this thesis, it may be interesting to investigate what mode of change the Business Model Evolution approach corresponds to according to their change model.

Among the many more different business model frameworks proposed, Alexander Osterwalders Business Model Ontology is among the most widely known concepts. One of the reasons might be because it is based on the similarities of a wide range of business model conceptualizations, drawing from an extensive literature analysis (Osterwalder, 2004). Another reason for its popularity certainly is that the rather technical thesis (2004) has been translated into a simplified version and was published as an attractive and easy to approach workbook called Business Model Canvas (Osterwalder et. al., 2010).

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Even though there are several frameworks about business models available today, the framework of Osterwalder (2004) is predominantly used in this work for several reasons. First, the so called business model ontology proposed by Osterwalder is based on a very extensive literature review, and therefore seen as one of the most comprehensive frameworks on the topic of business models available. As will be described later on, it includes all major elements of a business model, while excluding elements related but not internal part of it such as competitive landscape and implementation (Osterwalder, 2004). While these elements are related to business model, they are not part of it as such. A second reason this particular framework was chosen is, that even though Osterwalder has a strong background in ICT, the business model ontology is kept rather industry independent. In other words, the business model ontology is designed in such a way, that it can be applied very universally to various industries, businesses and products.

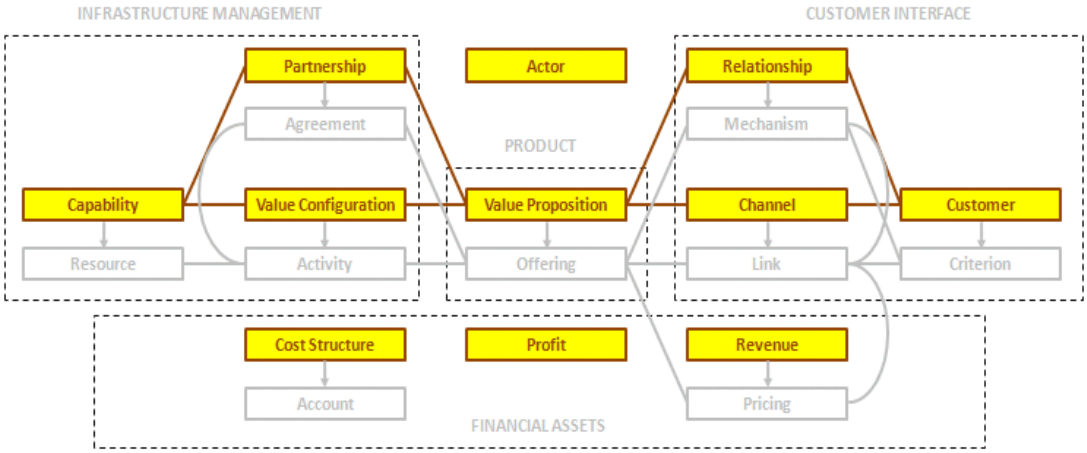

Figure 14. Business model design template (adapted from Osterwalder, 2004)

Finally, the framework is well defined and rather descriptive through the use of a business model design template shown in Figure 14. Following the nine key elements of business models are explained briefly.

3.2 Key Elements of Business Model

The following synopsis of the Osterwalder business model ontology is intended to give the reader an overview of the theory. It is mainly based on the extensive work of Osterwalder, Pigneur and Tucci (Osterwalder et. al, 2004, Osterwalder et. al., 2010) unless otherwise stated. However, the very extensive ontology was simplified to better fit the purpose in this work, as was proposed by Osterwalder himself (p.47).

The business model ontology from Osterwalder describes the money earning logic of a firm in four main areas, called pillars. Furthermore, a set of nine elements

called business model building blocks are unevenly allocated to the four areas. The four pillars, nine business model building blocks and their relationship to each other are visualized in the so called design template as shown in Figure 14. A summary of the four pillars, the building blocks and a brief description of them is given in Table 7.

Table 7. Summary of business model building blocks (adapted from Osterwalder, 2004).

Pillar	**Building block of the Business Model**	**Description**
PRODUCT	Value Proposition	A Value Proposition is an overall view of a company's bundle of products and services that are of value to the customer.
CUSTOMER INTERFACE	Target Customer	The Target Customer is a segment of customers a company wants to offer value to.
	Distribution Channel	A Distribution Channel is a means of getting in touch with the customer.
	Customer Relationship	The Customer Relationship describes the kind of link a company establishes between itself and the customer.
INFRASTRUCTURE MANAGEMENT	Value Configuration	The Value Configuration describes the arrangement of activities and resources that are necessary to create value for the customer
	Capability	A Capability is the ability to execute a repeatable pattern of actions that is necessary in order to create value for the customer.
	Partnership Network	The Partnership Network is a voluntarily initiated cooperative agreement between two or more companies in order to create value for the customer.
FINANCIAL ASPECTS	Cost Structure	The Cost Structure is the representation in money of all the means employed in the business model.
	Revenue Model	The Revenue Model describes the way a company makes money through a variety of revenue flows.

The product describes the value that the company is offering to the market. It includes all aspects of what a firm offers its customers, including the company's bundles of products, but also the manner in which it differentiates itself from the competition. As can be seen from the table above, the product is made up by only one business model building block called Value Proposition. The Value Proposition of a firm defines how items of value, such as the products as well as complementary value-added services are packaged and offered to fulfill customer needs. Therefore, the Value Proposition is related to the target customer and depends on the capabilities of the company. Osterwalder further decomposes the Value Proposition into elementary offerings that are described by four attributes, as shown in Figure 15.

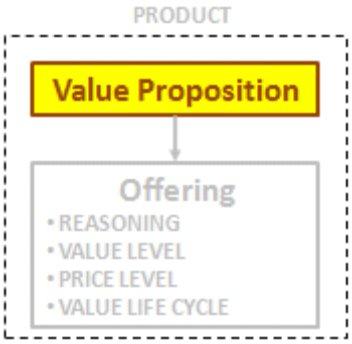

Figure 15. Value Proposition is the product of a company and consists of elementary offerings which are described by four attributes.

Each offering describes a part of the firms' bundle of products and is in turn further described through four attributes. These attributes of an elementary offering are reasoning, value level, price level, and the life cycle as shown in Table 8.

Table 8. Attributes of elementary offerings (adapted from Osterwalder, 2004).

Attribute	**Description**
REASONING	Why the company thinks its offering could be valuable to the customer. Normally value is created through: • use (e.g. driving a car) • reduction of risk (e.g. car insurance) • reduction of effort (e.g. home delivery of groceries)
VALUE LEVEL	How the customer value of the offering compares to the offerings of competitors. The measure includes: • me-too value (e.g. commodities) • innovative imitation (e.g. pocket pc) • excellence (e.g. Swiss watches) • innovation (e.g. Viagra in the 90's)
PRICE LEVEL	How the price level of the offering compares to the offerings of competitors. The scale includes: • free (e.g. online new-ticker) • economy (e.g. Southwest, Ryanair) • market (e.g. stocks) • high-end (e.g. Rolex)
LIFE CYCLE	Where in the value life cycle the offering creates value. The different situations in the value life cycle are: • creation (e.g. customization) • purchase (e.g. Amazon's one-click shopping) • use (e.g. listening to music) • renewal (e.g. Software updates) • transfer (e.g. selling of used books)

The customer interface concerns with the so called customer relationship management. In other words, the customer interface covers all customer related aspects comprising the choice of a firm's target customer for the offering, through

which distribution channels it gets in touch, and what kind of Relationship the company establishes with the customer. A visualization of the customer interface is shown in Figure 16.

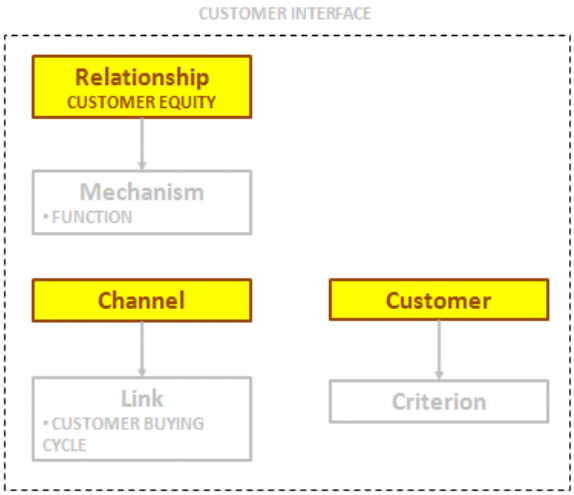

Figure 16. Customer interface comprised of customer, channel and relationship business model building blocks.

The target customer building block is concerned with a classical task of marketing management called customer segmentation (e.g. Kotler, 1999). In other words, which customer segment will be most attracted by the value proposition of a firm. The most general distinction of target customers exist between business and individual customers commonly referred to as business-to-business (B2B) and business-to-consumer (B2C). However, especially in B2C marketing the overall market is often sub-divided into smaller sub-segments based on specific selection criterions such as age, gender, price or specific interests. One big advantage of customer segmentation is that the product can be tailored more exactly to the preferences of this customer segment. However, segmenting the customers into too many sub-segments may have negative consequences such as large amounts of standard stock elements which in term generate high operation costs. Furthermore, offering too many varieties of a product may lead to customer dissatisfaction, even if the product itself fulfills the customer expectations well (Schwartz, 2004).

The distribution channel links Customers with the Value Proposition of a company. It allows a company to deliver value to its customers, either directly, for example through a sales force or over a website, or indirectly through intermediaries, such as resellers, brokers or cybermediaries. Its purpose is to make the right quantities of the right products or services available at the right place, at the right time to the right people (Pitt, Berthon et. al. 1999). Resulting from advances in ICT, new successful channels made the topic of distribution channels exciting in recent years, especially for in conjunction with digital products. While the channel element gives an aggregated view of how a company reaches its customers, it can be further

decomposed into elementary links. Table 9 lists the possible attributes of an elementary link.

Table 9. Attributes of elementary links (adapted from Osterwalder, 2004).

Attribute	**Description**
REASONING	A channel link can be part of an offering. Therefore, with the reasoning of offerings, a link can create value through the same three ways: • use (e.g. online after sales support functions) • reduction of risk (e.g. information sources reduce risk of wrong purchase) • reduction of effort (e.g. online troubleshooting, manuals, or direct links to product engineers)
CUSTOMER BUYING CYCLE	In what phase of the customer buying cycle a channel link creates value. The different situations in the customer buying cycle are: • awareness (customer identifies value proposition by means of advertising, promotions, public relations and partnership) • evaluation (customer compares available information about product to competitor products) • purchase (negotiation, decision, contract, order & tracking, billing & payment and fulfillment of purchase) • after sales (creating loyal customers by supporting them in implementation and use, training, maintenance, monitoring, troubleshooting and reverse logistics for disposal)

The relationship element describes the relationships a company builds with its customers. All interactions between the firm and its customers affect the strength of the relationship. While interactions come at a given costs for the company, they play also a key role to make profits. Therefore companies must analyze customer data in order to understand its customer equity. What type of customer is profitable and therefore worth acquiring, which are profitable and likely to make a repeat purchase and are therefore worth spending retention efforts on. As shown in Table 10, the relationship building block can be decomposed into individual mechanisms to create and maintain customer relationship and leverage customer equity. The table below summarizes the attribute customer equity of the relationship element and the attributes the relationship element inherits from individual mechanisms.

Table 10. Customer equity attribute of the relationship element and function attributes it inherits from individual mechanisms.

Attribute	Description
Customer equity*	Relationships can be classified according to their customer equity goals, which are: • acquisition (e.g. selling Gillette razor to new customer) • retention (selling disposable razor blades for already owned razor) • add-on selling (selling aftershave and shaving gel)
Function	A relationship mechanism can fulfill one or more of three functions: • Personalization (company knows preferences, tastes and needs of individual customers and can target products accordingly) • Trust (measurable believe of one party on another that it will behave dependably for a specific period within a specific context) • Brand (identifies product through name, symbol and others and how it relates to key constituencies: Customers, Staff, Partners, Investors...)
Inherited from LINK	If a relationship mechanism is also a channel link it inherits: • customer buying cycle (overwritten by value life cycle if relationship mechanism is part of the value proposition) • value level • price level

*Customer equity is an attribute of Relationship, not MECHANISM

The infrastructure management describes how the company arranges its activities, capabilities and partnership network in order to create the offering. In other words which abilities the company should have in order to provide its value proposition but also to ensure the customer interface. The infrastructure management pillar describes Value configuration, the partnership network and the capabilities of the organization. A visualization of the pillar is shown in Figure 21.

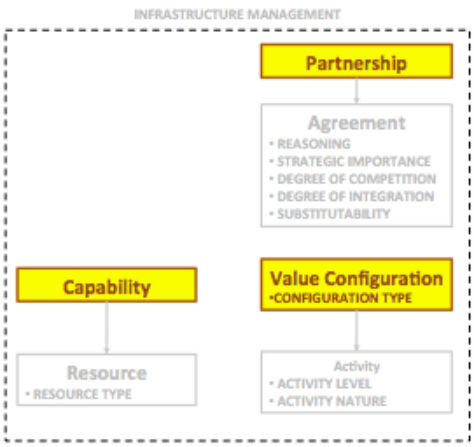

Figure 21. Infrastructure management pillar.

The capability building block describes the assets the company has in order to achieve its goals. These may include assets that the company owns, capabilities its

employees have and structures that enable the company to use these capabilities to provide its value proposition. In more traditional industries the capabilities of an organization may be suspected mostly in its physical resources to manufacture physical goods (e.g. machineries, plants, equipment). However, other intangible resources are more often the key capabilities that an organization needs in todays fast changing business environment to maintain its competitiveness. The capability building block describes the overall picture of the company, and is divided into three resource types as shown in Table 11.

Table 11. Resource types making up a company's capability (adapted from Osterwalder, 2004, the examples in the description provided by the author).

Resource type	**Description**
TANGIBLE	The tangible assets of an organization concerns with the most conventional resources that traditionally appear on the balance sheet of a company. It may include: • Manufacturing plants, assembly lines • equipment
INTANGIBLE	The intangible assets have gained much importance over the past decades. While it is often difficult to evaluate the value of such assets, they do play a very important role. Intangible assets may include: • patents • copyrights • brand value
HUMAN	The human resources are of extremely high importance to most companies, especially due to the shift of many industries requiring no longer physical labor, but knowledge workers. Some human resources an organization can have available are: • Abilities and skills of individual workers • Ability of teams to perform • Ability of different departments to collaborate • The company culture

The value configuration Building block describes the internal and external activities of the organization to create its value proposition. The level of description chosen is the individual activity that is performed. The framework distinguishes between three basic value creation types, the value chain, value shop and value network. The value chain configuration usually applies if the organization is delivering its product through a standard chain of activities. The value shop is present in organizations that tends to come up with new solution, rather than reproducing one solution like in the value chain. Thus the performed activities in the organization depend on the specific case. One example of this are service providers that provide a specific product to the individual customers needs. The value network creates value by linking clients and customers. In this case, the activity of the company is to establish, provide and maintain the connections.

The activity element can either be a primary or support activity. Primary activities are activities involved in the actual creation of the value proposition, its marketing and delivery. The support activities are providing the fundament for the primary activities to take place like infrastructure, human resource management, technology development and procurement. The activity nature depends on the value creation type, and is summarized in Table 12.

Table 12. Activity nature by value creation type (adapted from Osterwalder, 2004).

Value Creation Type	**Activity nature**
Value Chain	Activities for Value Chain type of value configuration include: • Inbound Logistics • Operations • Outbound Logistics • Marketing and Sales • Services
Value Shop	Activities for Value Shop type of value configuration include: • Problem finding and acquisition • Problem solving • Choice • Execution • Control and evaluation
Value Network	Activities for Value Network type of value configuration include: • Network promotion and contract management • Service provisioning • Network infrastructure operation

The last building block of the infrastructure management pillar is the partnership network. This building block outlines the activities performed and resources contributed by the company's partners. There are many areas of business that might be performed by a partner, rather than by the company itself. The terms and conditions negotiated between two parties cooperating are usually the basis for such a partnership. Thus, the sub-element categorizing this building block is the agreement. Osterwalder differentiates between three reasons for an agreement, and further describes an agreement with four additional attributes as summarized in Table 14.

Table 13. Attributes of the agreement (adapted from Osterwalder, 2004).

Attribute	**Activity nature**
REASONING	The three possible reasons for an agreement are: • Optimization and economies of scale • Reduction of risk and uncertainty • Acquisition of resources
Attributes	Attributes qualifying the nature of the agreement, given a grade from 0 (very low) to 5 (very high) : • Strategic importance • Degree of competition • Degree of integration • substitutability

Finally, the financial assets concerns about the revenue model and cost structure to enable the business to operate in a financially sustainable manner. Both building blocks are strongly influenced by the other elements of the business model canvas. These two blocks determine the ability of the company to survive financially. An overview of this pillar is shown in Figure 22.

Figure 17. Financial assets comprises the revenue model and the cost structure of a company.

The revenue model describes how the company is able to generate a revenue stream of its value proposition from the customers. A company's revenue model can be comprised of several different revenue streams with different pricing mechanisms. Osterwalder thus uses revenue streams as the sub-element of this building block that can have different attributes as summarized in the Table 15.

Table 14. Attributes of the revenue stream (adapted from Osterwalder, 2004).

Attribute	**Activity nature**
STREAM TYPE	The five possible revenue stream types are: • Selling • Lending • Licensing • Transaction cut • advertising
PERCENTAGE	Measures how much of the total Revenue Model is derived from a specific revenue stream
PRICING METHOD	Describes how the price is determined: • Fixed • Differential • Market

The last building block of the Osterwalder business model canvas is the cost structure element. It measures all the costs that incur in a company to create, market and deliver the value to its customers. It is usually divided into different accounts that act as the sub-elements of this block. It is described with two specific attributes the sum and the percentage. The sum measures the monetary value of an account, while the percentage simply measures how much each account contributes to the total cost structure.

For this thesis, an adapted visualization of the business model canvas was designed to highlight the inter-connection of the different building blocks. Furthermore, this visualization helps to understand the idea of Business Model Evolution, as it can highlight which of the pieces are "fully developed", and which ones are just at a "bare minimum" to connect the adjacent building blocks. A representation of the business model with all blocks as shown as "fully developed" is shown in Figure 18. Fully developed means that it represents the Business Model as it is envisioned for the fully developed StarEyes project.

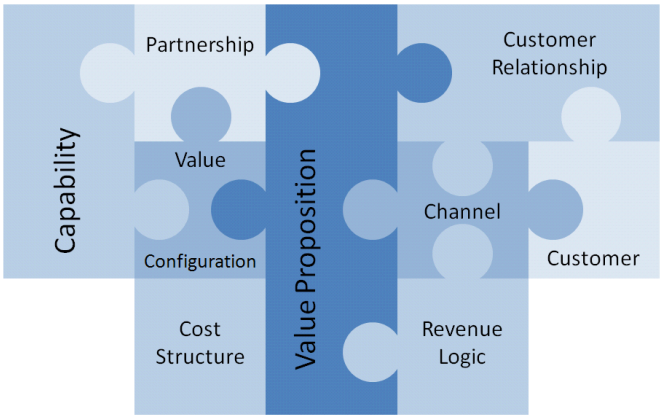

Figure 18. Symbolic representation of final business model (target business model).

In the discussion about digital products, it was noted that one of the most significant differences between physical and digital products is the possible revenue models they allow. Since this topic has been thoroughly discussed in the gaming and start-up scene, possible revenue models are introduced more thoroughly following.

3.3 Revenue Models for ICT and Games

Osterwalders gives five very generic revenue streams to describe a company's revenue model: selling, lending, licensing, transaction cut and advertising. However, especially when dealing with digital products (due to their distinctive characteristics discussed in Chapter 4), there has been a lot of discussion around revenue models. Interestingly they are often discussed under the term business model. However, with the background of Osterwalders framework they are usually rather describing the revenue model of a business model, even if they often involve other building blocks such as the value proposition specially designed to support the revenue stream.

One reoccurring term with regard to online services, and especially games is a model called Freemium. As Chris Anderson describes in his book 'Free – The future of a radical price (Anderson, 2009), more and more online services are at

least partly made available for free. According to Anderson, the steeply declining prices of three essential technologies are responsible for this trend: computing power, digital storage and transmission capacity. The performance of these technologies has been increasing at an exponential rate for a long time, while the costs have stayed the same if not decreased. And there are good reasons to believe that this will continue (Kurzweil, 1999). Andersson put it nicely by stating " Reproducing and delivering digital content — words, music, software, pictures, video — has now fulfilled the prophecy once made about electricity. It has become too cheap to meter."

The fact that a digital product can be made available to people for almost no cost has obviously very strong implications on the business model. This allows companies to offer their product with a Freemium revenue model. Freemium means that, some form of the basic product is available to the users for free, while certain restrictions or limitations are imposed. Anderson lists four possible limitations (Anderson, 2009), and later added another limitation (Kincaid, 2009). The different restrictions are summarized in Table 15.

Table 15. Different tactics for freemium models, adapted from (Anderson 2009 and Kincaid 2009).

Restriction	Description and examples
Time limited	Restrict the usage after a certain time. E.g. 30 day trial
Feature limited	Basic version free, while the full functionality is given with the paid version.
Seat limited	Can be used by a certain number of people for free. E.g. software solutions for small companies that might turn into paying customers if the organizations grow.
Customer type limited	A certain type of customers get the product for free. E.g. Microsoft's BizSpark where companies younger than 3 years and with revenues below $1M may use business software for free.
Capacity limited	Limit the capacity of the product, usually the storage space. E.g. Dropbox, get 2GB storage for free, but if you want more, you have to pay.

However, the Freemium Model is only one of many possible revenue models a game company can chose to market their product. David Perry compiled a list of 29 different monetization models for games, ranging from traditional Retail (bricks & mortar) or digital distribution of games to different revenue streams that involve elements within the game (Liew, 2008). Perries list has not been derived in an academic fashion but is based on his experience. Thus, he himself stated that the list is most likely not complete and that there are other models around and possible.

Still, it is the most comprehensive list found by the author, and summarized in Table 16.

Table 16. Monetization models for game companies (Adapted from Liew, 2008)

Model	**Description / example**
Retail (bricks & mortar)	Selling boxed games in stores
Digital distribution	Direct download to consumer
In-Game Advertising	e.g. as visual elements or even built into story
Around-Game Advertising	e.g. banner ads on the screen (not part of the game)
Pay finders fee	Pay people who find new buyers
Advert games	The whole game is an advertisement, and game developers get paid by the advertising company
Try before you buy	Also termed Trial ware, Shareware, Demo ware, Timed ware. Lets players play limited version of the game.
Episodic Entertainment	You buy episode as they become available
Skill-based progressive jackpots	Players pay to get into a certain tournament, and the winner will receive part of the jackpot
Velvet Rope or Members club	Users pay to get special privileges in the game
Subscription model	Pay a monthly fee
Micro-transaction	Small, impulse driven up selling (e.g. for vanity, saving time, leveling up faster etc.)
Sponsored Games, Donation ware	Games that somehow help society, could be paid by philanthropist or charity / non profit organization
Pay per play / pay as you go / pay for time	Like arcade games where you pay for what you need (e.g. preset number of lives, time, etc.)
Player to Player trading of virtual items	Keeping a cut of the monetary exchange between two players for virtual items in the game
Foreign distribution deals	Pre-selling foreign distribution rights to fund the project
Sell access to players	E.g. ask players to answer certain questions a 3rd party would be interested in paying for
Freeware	Getting lots of users and then being acquired
Loss Leader	Selling the game too cheap, in order to profit from other product sales (e.g. toys)
Peripheral Enticement	If the game cannot function with a special piece of equipment, sell the equipment
Player to player wagering	Place a bet between two players and keep a percentage of the waged money
User generated content	Let users create sell their content to others and keep a cut of the transaction
Pay for storage space	Charge users for keeping stats, progress, game

	data,… on the server
Pay for private game server	Rent multiplayer servers for maximum quality (e.g. for first person shooter multiplayer crowd)
Rental	Rent the game (or access to it) for a certain time period
Licensing access	e.g. giving customers of another service access to the game, paid by the other service (e.g. cyber café)
Selling Branded items	Selling toys, shirts, other gear with your brand
Pre-selling the game	Get funding from fans who then get free access to the game once it is complete
Buy something, get game for free	Get the game free when purchasing another service or product, and get a cut of that purchase

As discussed earlier, an organically growing firm needs some seed funding to start the operations that lead to an income. This company could be said to have already reached maturity when it is able to reinvest enough money in its continuous development. The important aspect is that the resources required for the company's continuous growth are in proportion of the revenue of the firm. A high growth company on the contrary does not rely on its own income to finance its growth, but rather on external financial resources. These external financial resources for high-growth ventures come in different formal and informal investors. The subject of this thesis is a potential growth-oriented business in the Internet technology field. Therefore the following discussion concentrates on growth patterns of this kind of start-up companies. Many different growth models and life cycle definitions can be found in the literature (see e.g. Ala-Mutka, 2004). One model distinguishes between four phases of a company development and the respective target status of each phase as shown in Table 17 (Rasila, 2004).

Table 17. Phases of company development and target status (Rasila, 2004)

Company phase	SEED	START-UP	GROWTH	MATURE
Target milestone	FROM VIABLE TO PROSPECTIVE	FROM PROSPECTIVE TO INVESTABLE	FROM INVESTABLE TO LISTABLE	LISTED
Operating mode	SOLO	V2C	VC	PUBLIC
Months from start	0…24 MONTHS	6…36 MONTHS	24…60 MONTHS	36…120 MONTHS

Although not all start-up companies follow this path, the four phases characterize the typical growth pattern of many start-ups. After the initial business idea, the founders use seed funding from their own pockets or from friends and families (3F) to finance the first steps of the business to bring it to a start-up phase. However, in the start-up phase, additional capital is usually required that often exceeds the means of the 3F. On the other hand, professional venture capitalists are often not willing to invest in such an early phase of a business. In other words, the company can be said to be prospective, but not yet investable. To be investable in the eyes of most venture capitalists, usually already some paying customers and revenue are required, or at least the prove of concept and market potential. While venture

capitalists in the US are more willing to take risks if the potential profits are very high, in Europe money is less available to project with higher risk of failure. Therefore, the challenge of many start-up companies especially in Europe is to bridge the financial gap from a prospective to an investable status, in order to advance their growth. Figure 19 illustrates in what phases of the company which sources of finance may be available to the start-up company.

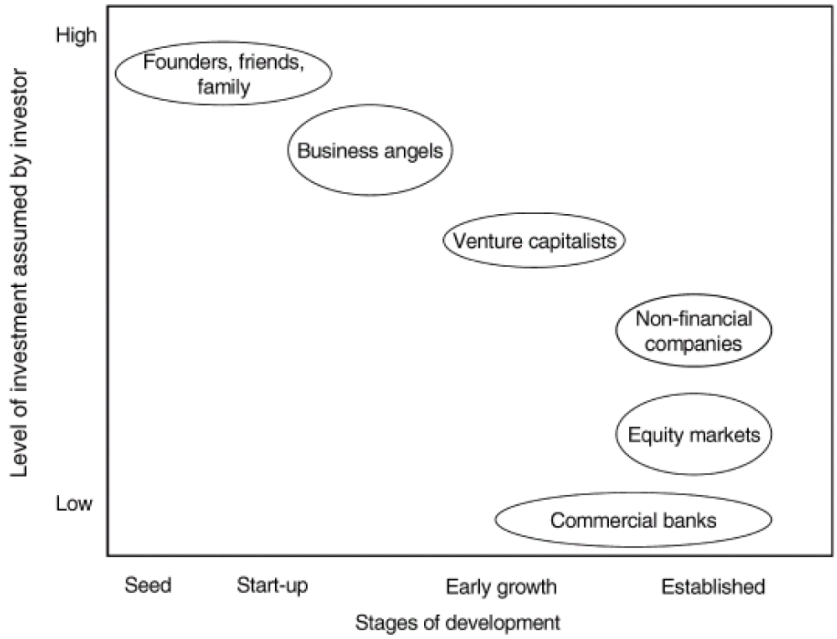

Figure 19. Financing sources for start-up companies in different phases (adapted from Van Osnabrugge and Robinson, 2002).

However, the need for external support is for many start-up companies twofold. Additional to the more obvious financial gap that entrepreneurs often encounter when trying to realize their business plans, there often also exists a knowledge gap. In many cases, the entrepreneurs are not experienced enough in some particular field, or lack specific business knowledge and network. The combination of financial and knowledge gap has become the challenge for so many start-ups, that it led to the concept of Venture to Capital (V2C) (e.g. Seppä, 2006). The knowledge gap could be covered by recruiting a suitable person into the team. However, since these people are often senior, this would even worsen the financial situation of the start-up company. Another possibility is to give up part of the company shares as remuneration for the additional senior team member. However, there are also other possibilities to be considered when facing the equity and knowledge gap in this V2C phase. Rasila lists no less than 28 different actors in the V2C field (Rasila, 2004). In essence, these actors all work after the principle that the entrepreneurs have to sell a part of the company in exchange for either capital, knowledge or a combination of both.

Seppä and Näsi sketch three scenarios of how a company's ownership may develop from a start-up (prospective) to a mature phase (listed) (Seppä and Näsi, 2001).

These three scenarios are first, playing solo (the lonely walk of a prospective venture to an IPO), second, pushed by VC (the fast lane of an investable venture to the IPO), and third, accelerated by V2C (the fast lane of a prospective venture to the IPO). The developments of company ownership for these three scenarios are shown in the figures below.

Assuming the company valuation increases over time, the three scenarios indicate that playing solo result in a larger profit for the entrepreneur than the two accelerated approaches. Furthermore, a larger share of the company obviously means also that the entrepreneur has more decision power in the organization. The downside of the playing solo approach is that the duration until the mature state is rather long. In other words, the organization would have to grow organically until the IPO. However, as discussed in the previous chapter, because of closing market opportunity windows, or due to high up-front investments for the initial product development, organic growth is especially for Internet companies often not advisable or even possible.

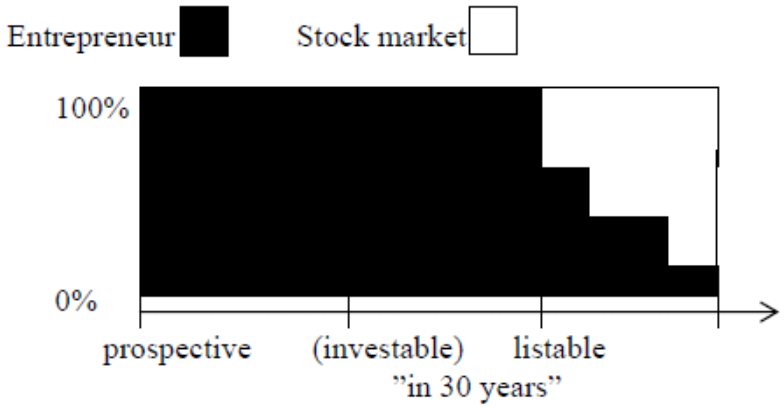

Figure 20. Scenario 1 of ownership development during growth: playing solo.

For companies that require more capital to get started than could be covered by the founder, the two accelerated scenarios shown in Figure 20 and Figure 21 might be suitable alternatives. The first, more traditional choice would be to develop the company far enough to attract venture capital. However, as was discussed before, the so called capital gap makes this endeavor increasingly difficult for many start-ups aiming for high-growth pattern, because upfront costs are high, and development might have to be sped up.

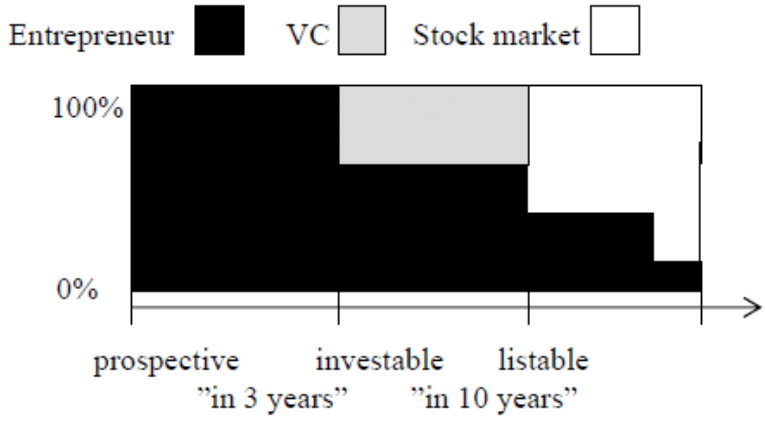

Figure 21. Scenario 2 of ownership development during growth: pushed by VC.

To overcome the capital gap, getting investment of an incubator, business angel or advisor, is a very suitable approach for many start-ups. Depending on how high the financial and knowledge requirements are, the capital gap can be bridged by one of these different actors. However, if the start-up requires capital yet another order of magnitude higher, these options may not be suitable. In the best case, the founders would have to give away a significant share of their ownership. However, in practice the chances for a team of first-time entrepreneurs without a successful senior partner to raise several million Euros of venture capital are very low.

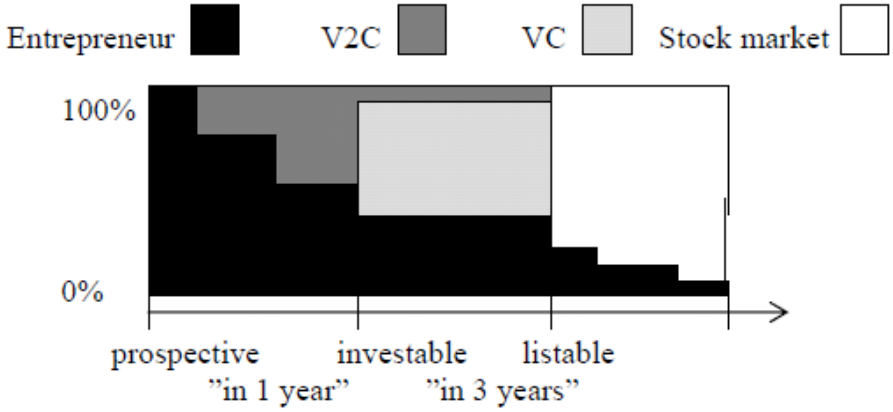

Figure 22. Scenario 3 of ownership development during growth: accelerated by V2C.

As was mentioned earlier, life cycles of digital products can be extremely fast. This of course means that also often the window of opportunity is rather short. Thus, financing the business by growing the revenue organically might not be a good option, as it might cause the company to lose the race against its competitors. Therefore, building the business over different stages might be a good alternative. This might allow the start-up attract appropriate funding for scaling the growth and development of the company. The framework for this approach developed in this thesis was termed Business Model Evolution for high-growth start-ups, and is thus introduced following.

3.4 Business Model Evolution for High-Growth Start-Ups

When building a company, many entrepreneurs find themselves in a situation where they try to solve a chicken and egg problem. This is what happened to the founders of Ovelin. Getting funding proved to be very difficult without at least a prototype of the product envisioned, while building a prototype required at least some initial funding. Since chicken and the egg obviously "found" a way into existence, the idea behind the business model evolution framework was to have a look on how its done in nature.

Complex organisms come into existence through a process called evolution by natural selection and was discovered by Charles Darwin who published it in his groundbreaking book On the origin of species in 1859 (Darwin, 1859). As we now know, every living thing on the planet has developed from a simple organism through incremental steps caused by random mutation and selected for by the conditions and resources available at that enabled or disabled reproduction. In other words, complex organisms do not come about in one blow, but evolve over time and adapt to their environment and the available resources and conditions.

While the topic of Evolution is extremely interesting, it is treated extremely briefly in this thesis, and introduced for one idea only: to borrow the idea of developing a complex system over several stages. Obviously the analogy to evolution in biology to the here proposed evolution of business models is only drawn for this limited area. The probably most important difference between the two ideas is the fact that in Business Model Evolution the gradual steps are planned by the entrepreneur with a desired outcome in mind. This is obviously not the case in biology where a "desired outcome" does not exist.

Building a business over several stages can be, and often is the only available path to take for entrepreneurs. The advantages and disadvantages of deliberately developing a business over several stages will be discussed later in this Chapter, and the reasoning why this approach was chosen was already given in the introduction. However, not every business can be built in such a way. Two key requirements that would enable such an approach are:

- no irreducible complexity of the product itself
- a suitable business model available at every project stage

In biology, irreducible complexity is a train of thought that questions weather there are systems so complex that they cannot be developed out of simpler systems. It proposes that certain biological systems are too complex to have evolved from simpler systems. Irreducible complexity postulates the requirement for the presence of multiple components of certain complex systems for the system to accomplish its function. Since a simpler system would not be able to perform the task at all,

and thus the selection process could not drive incremental improvements. Typical examples are questions like ‘what is the use of half an eye’ or ‘half a wing’. However, the eye or the wing does not represent an example of irreducible complexity. In the example of the eye, even simpler systems like photoreceptor layers on the skin are better than no system at all. Figure 23 shows how a fully working eye can evolve out of a simple pigmented spot.

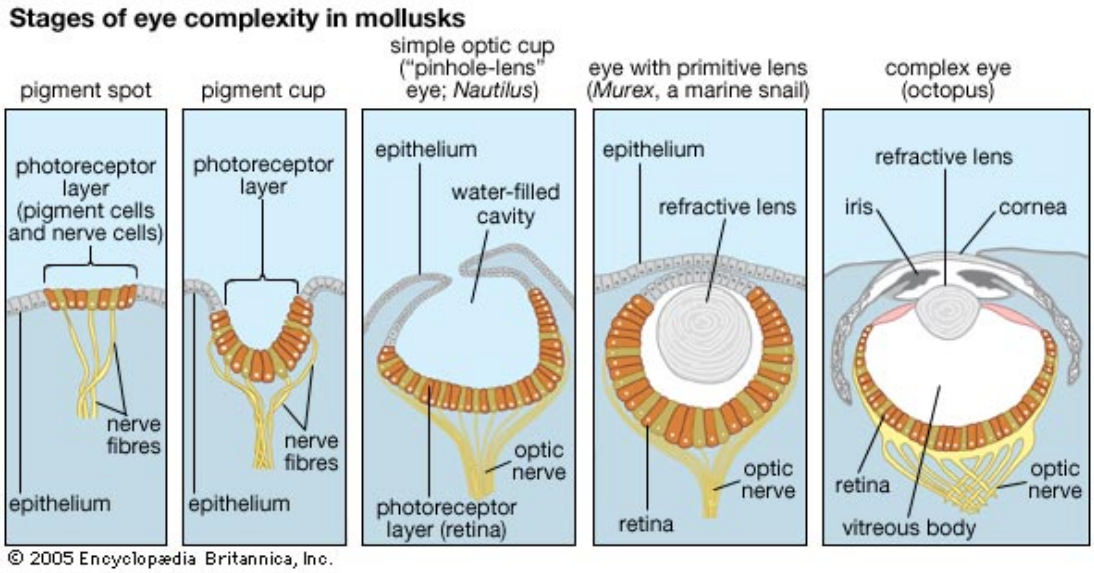

Figure 23. Stages of eye complexity (Encyclopedia Britannica, 2005).

However, there are of course many systems developed by humans that were indeed too complex to have evolved through evolution. For example are there no known animals powered through nuclear energy or able to hunt for pray using laser light.

Transferred into the context of developing a product, irreducible complexity means that the product is already usable and reasonably useful in a stage when only some of the elements of the anticipated product are available, while others are completely missing. As an example, a Pizza delivery business does not qualify for irreducible complexity, since it can already operate as a restaurant, even if the delivery element is still missing. A simple example for an irreducible complex system could be a telecommunication network. Here the system is useless, until all of the key elements that is telephones, switches and network lines, are in place.

The second requirement for such an evolution approach is the availability of a suitable business model for each sub product. At every stage of development the company needs to be able to answer the most important questions about product, customer interface, infrastructure management and financial assets. While the non-irreducible complexity requirement is based on a technical usefulness of the product itself, the existence of a suitable business model is also required, so that the product may also be reasonably marketed. In other words, the product does not

only have to be technically possible, but also marketable under the existing conditions.

It is the manager's role to design or adapt a company's business model by responding to these external forces. (Osterwalder, 2004). However, adapting the business model over time may also be required to build up the business, either because of strategic reasons or due to a lack of funding. This can be the case for start-up companies that do not have the necessary funding to finance the development of their whole product. Therefore, the proposal in this thesis is to subdivide the development of the product into several stages. In order to gain any advantage from such an artificial division, a suitable business model has to be developed at each stage. In other words, the business model has to evolve over time, in order to adequately capitalize potential revenues or other benefits from the product at its current stage. The requirements for a venture to take such an approach have been discussed previously. The business model evolution process is explained on an example where two changing processes take place before the business has reached its anticipated position.

First, a scenario of the anticipated business model has to be outlined, including the final version of the product and expressed in the nine business model building blocks. This process alone may take several weeks or months to develop, depending on the venture. A symbolic representation of the final business model is shown in Figure 24, where each of the nine business building block is represented as a piece of a puzzle that fits to its adjacent pieces.

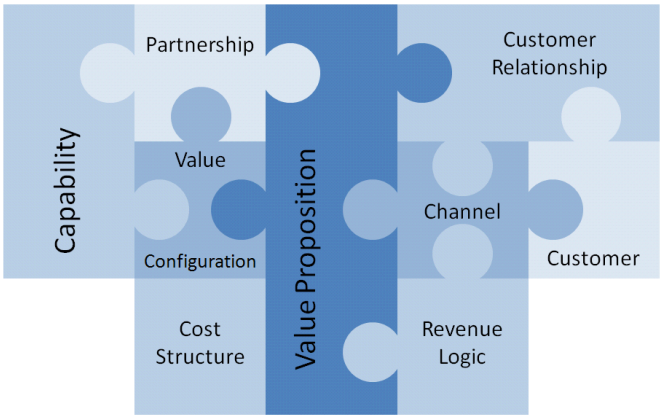

Figure 24. Symbolic representation of final business model (target business model).

The target business model gives a good orientation for the organization during its development. However, it has to be kept in mind that much new knowledge may be gathered during the first steps of product development that may have an influence on the target.

Once the target business model has been outlined, one or more limiting factors in the business model may become apparent. In other words, which building block or

blocks are with the current resources or network not realistically attainable for the start-up. For example, the product development is so extensive, that only a trimmed down version can be achieved with the current resources. Another example could be that an important partnership network may not be at reach at all, due to the early stage of the project. Therefore, the building blocks that are available in the early phase of the project may not be the same as those anticipated in the target business model. Figure 25 shows a symbolic representation of the initial situation with limited Value Proposition available and indicating that the anticipated partnership network is not yet possible.

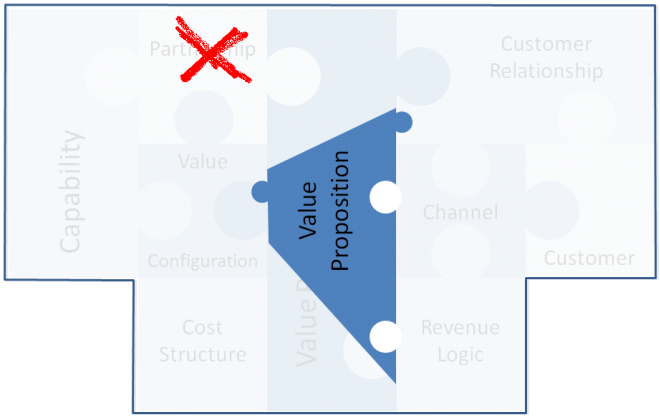

Figure 25. Visualization of initial situation: limited Value Proposition available and anticipated partnership network not yet possible.

Figuratively speaking, the business model puzzle has to be solved so that it shows an as good as possible business model. In other words, the challenge of the entrepreneurs is it to find out what other building blocks are available that would match best possible to the limited presetting. For example, since the partnership network is not yet available, the capabilities of the start-up may have to comprise also skills that later on would be covered though the partnership network. The symbolic visualization of the business model for this first phase of the start-up is shown in Figure 26.

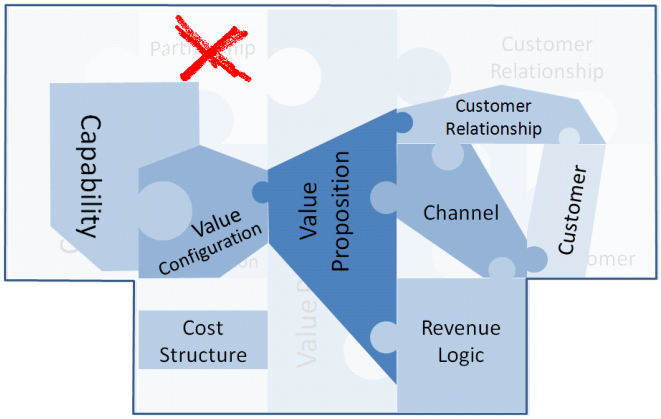

Figure 26. Initial phase of the business model, with building blocks adapted to limited value proposition and missing partnership network option.

With this initial setup, the start-up is able to develop a first trimmed down product, and therefore gain first market experience, customer feedback and possibly even some revenue. In case the market entry went according to plan, the organization can now for example improve its value proposition to get a better customer relationship. Furthermore, this may make a different customer group accessible. The visualization of this intermediate step is shown in

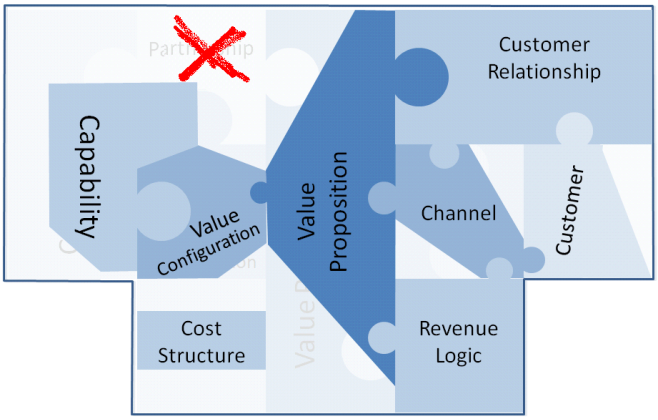

Figure 27. Intermediate phase of business model, with larger value proposition for a better customer relationship and access to an additional customer segment.

After this intermediate phase, the start-up has now gathered a significant customer base and achieved first sales. Therefore, it was able to attract an investor and sign a deal with the anticipated partnership organization. However, the partner organization was not able to fill the whole requirement that was initially anticipated, for which reason the start-up has to cover these capabilities. Therefore, the business model in the final phase is slightly different than the one anticipated in the target business model. A visualization of the target business model is shown in Figure 28.

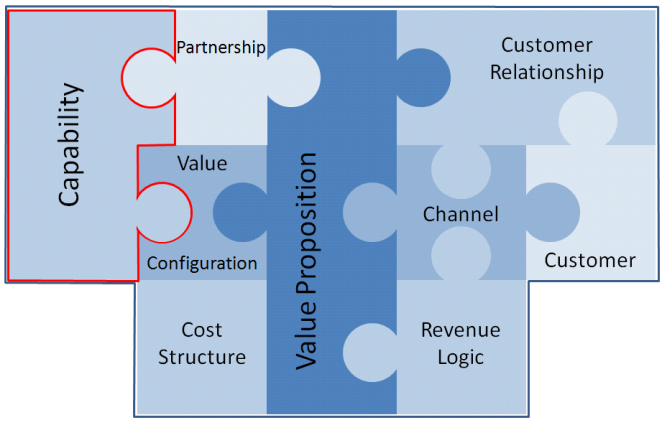

Figure 28 Business model of final phase, with a minor change in the partnership network as compared to the initially anticipated target business model.

Obviously this is a simplified example, and in reality there might be several possibilities to solve the business model puzzle, or none. Furthermore, many unexpected things may happen in the meantime, making the plan of staging several business models obsolete already after the first stage. However, the business model evolution demonstrates one nice possibility to break free from the chicken and egg problem of not being able to solve the one problem before another one is solved, which in terms can only be solved if yet the previous one is solved.

The framework of Business Model Evolution, combining the Business Model development over different stages, and the ability to attract sufficient funding accordingly is summarized in Figure 29.

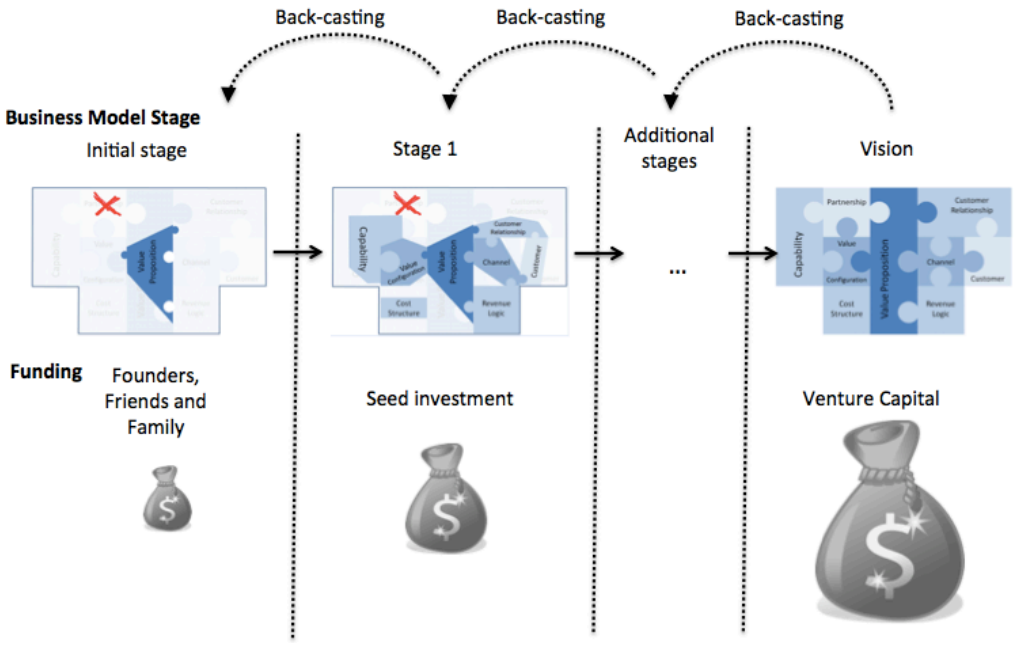

Figure 29. Business Model Evolution visualization. Showing the back-casting from an envisioned business model, the resulting intermediate stages, and the anticipated funding sources in the different stages.

This theoretical framework is next applied to the case of Ovelin. Instead of developing StarEyes in one large development and finance attempt, it is divided into several intermediate stages.

4 BACK-CASTING BUSINESS MODEL EVOLUTION FOR OVELIN

4.1 IDEA OF LEARNING GAME

Playing computer games, surfing in the internet and actively participate in social networks are currently among the most popular free time activities for a large portion of people, especially children and teenagers. While there is nothing downward wrong about this fact, one cannot help but wondering what could be achieved by individuals, if the same amount of time and dedication was invested into another activity, such as practicing on a music instrument. Like playing a video game, playing an instrument requires a lot of time and determination to practice a certain motor skill over and over again, until it becomes tacit knowledge. In the case of the video game, the correct handling of a controller leads to a desired result in the game, while in the case of making music, the correct handling of the instrument leads to a desired sequence of sounds. The handling of a game controller is usually an arbitrary function related to a particular game with little real life application, as is the handling of a certain instrument bound to that particular family of instruments. In other words, tacit knowledge in handling either of the respective "controllers" is of little use if the controller becomes obsolete. However, the difference between the two cases is that new computer games and controllers appear all the time, rendering most others obsolete after a few years. Music instruments on the other hand, have often a century long history, and their existence is likely to endure also in the far future. Even through learning to play an instrument may not be better or more challenging than mastering a certain game, but the skill learned for the instrument and the joy gained from it usually stays with a person for the rest of their lives.

Computer programs and software products for office, communication or entertainment purposes are today commonplace in most of the world. The enormous advancement of quality and functionality, and the ease of availability made them preeminent substitutes for many traditional products. Not only do they often outperform the traditional means of for example business transactions, they also present new possibilities in work flow, education or as free time activities unimaginable in times before computers and the internet. Computer games as well as software for professional use have developed from simple packages to extensive high-tech products. Alongside the development of software products, also the quality and especially the availability of input and output devices have increased. A standard laptop today features camera and microphone to supplement the traditional input devices of mouse and keyboard, as well as ever increasing data processing and transmission capabilities. In other words, a standard computer is, given suitable software, capable of "listening" to played notes on an instrument, evaluate them and give feedback about the performance. However, the availability

of feedback is often not the main difficulty of music students to overcome. Rather a lack of motivation hinders the students to master their respective instruments. However, the availability of audio signal analysis technology enables new methods to incorporate the music learning process. For example, combining music instrument rehearsals with game features is one possible method to overcome the motivation phenomenon illustrated following.

The wish to play a music instrument is often induced by parents, friends or music idols, and usually the motivation when beginning to practice is rather high. However, once started, the repetitive practicing of tone sequences reduces the motivation dramatically. In this phase many people quit, while only the persistent students continue to practice. Once a certain level of musical skill is achieved, playing the instrument becomes fun, and the motivation to practice increases again. For many musicians, the joy of playing a music instrument lasts for a lifetime. This motivation changes are illustrated in Figure 30.

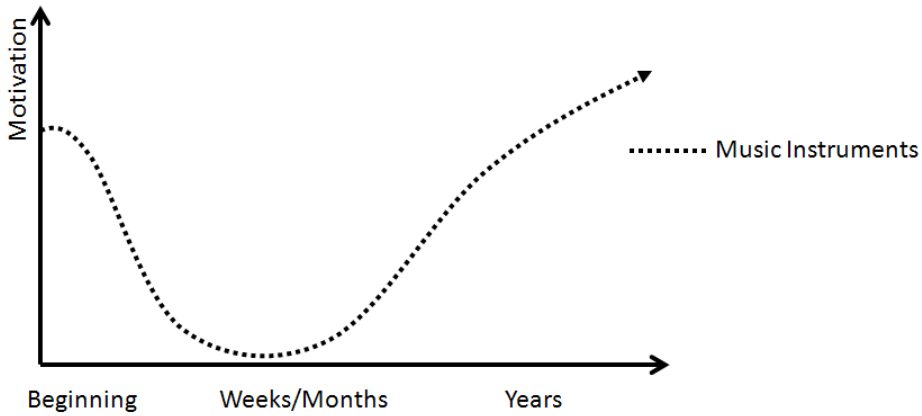

Figure 30. Schematic development of motivation to practice playing a music instrument.

The motivation curve to play video and computer games, and use social networks on the other hand is rather different. The motivation of an individual to search for new game or social network to use is usually low and often created through advertisement or word of mouth. However, many of these games and networks are designed to keep the users hooked, once they are used. In other words, the motivation to keep on using the service is very high. Nevertheless, after some months or a few years, most games or networks lose their attractiveness and the users switch to another product. The motivation curve of games and social networks can be seen shown Figure 31.

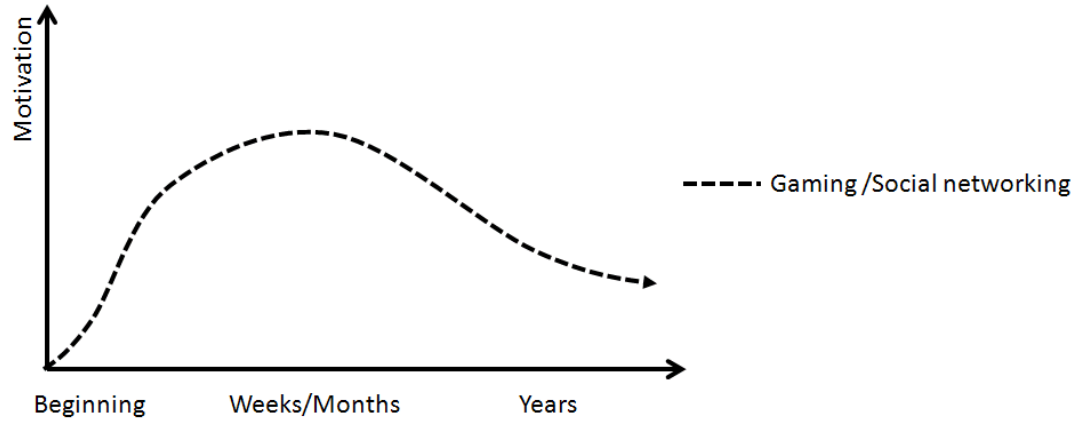

Figure 31. Schematic development of motivation to play video games or engage in social networks.

These motivation curves pose the problem to computer game and social network developers, to constantly create new features, in order to keep the users interested. Furthermore, an initial incentive to attract users in the first place has to be created through advertisement, media hype or word of mouth. On the other hand, people that dream of learning how to play a music instrument lose their motivation quickly, and therefore lose the chance to obtain a skill they could enjoy for the rest of their lives. Therefore, if the widespread desire of people to play a music instrument could be coupled with the addictive and motivational characteristics of gaming and social networks, a new user experience could be created. The vision of Ovelin is to combine these two elements, to create a highly motivating user experience that endures, as illustrated in Figure 32.

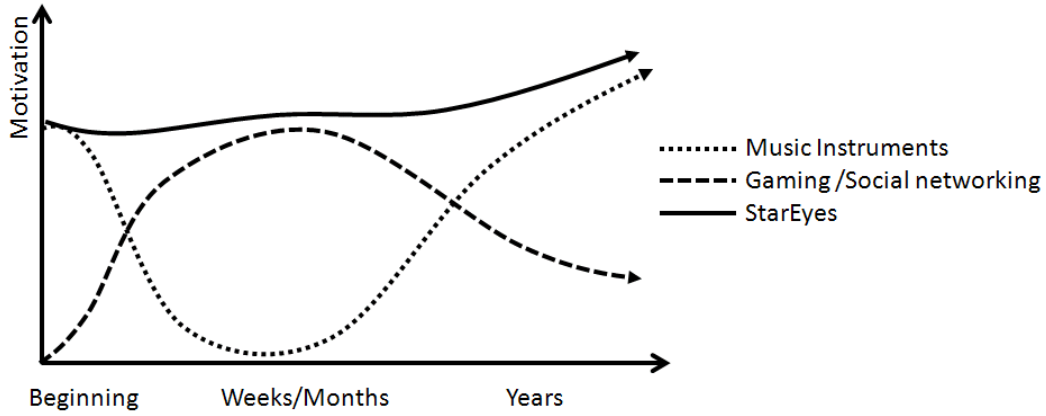

Figure 32. Comparison of schematic development of motivation to practice on a music instrument, play video games or engage in social networks versus the envisioned motivation development of using StarEyes.

It is arguable whether or not and when such systems may outperform traditional teaching methods. However, there are many elements, such as availability, where traditional music tuition is outperformed by a computer based music instrument learning game. In other words, if there are at least some relevant major benefits of a

computer based learning system, there is the possibility to building a business around it. However, as this business would be an entirely new venture, a business model is not available already on the market that could be copied. In other words, a suitable business model should be searched for, based on the current stage of knowledge. Figure 33 symbolizes the goal of finding a suitable business model to market such a product.

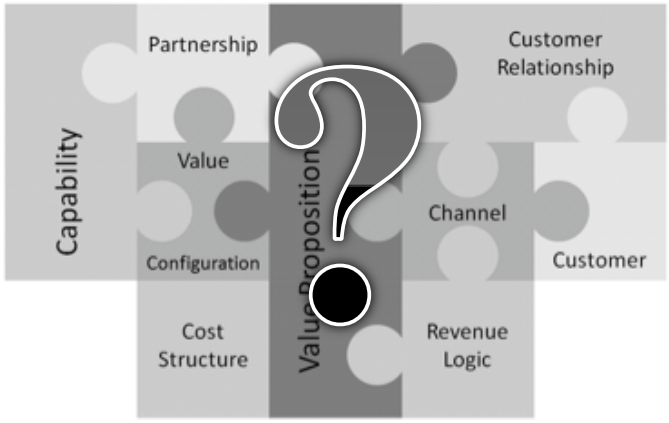

Figure 33. Business model for computer based music instrument learning system unknown.

Admittedly, advanced music skills such as improvisation is much more likely to be taught by a personal, skilled musician or teacher. However, the majority of music students never reach such high basic skills. In other words, most students quit practicing in a much early stage, when practicing is still rather boring and monotonous. One of the key factors to playing a music instrument is motivation. Therefore, a computer assisted music tuition system may be used to motivate people overcome the initial rather during practice, until a level is reached where playing the instrument is more fun, and a personal teacher may be useful to help the student progress. An analogy could be drawn from the use of flight simulator programs supplementing real flight lessons.

A simulator will probably never be able to reproduce the exact circumstances and conditions of a flight in a real airplane. However, many of the standard procedures and situations can be practiced almost as good as in a real airplane, but at a significantly reduced cost. In other words, the flight simulator can be used to train many situations, and therefore reduce the dependency of prospect pilots on planes and instructors. Furthermore, the procedures required in certain situations like the shutdown of a turbine can be trained without the risk this would involve in a real flight situation. With regard to this, a flight simulator may even outperform the flight lesson in a real airplane. Nevertheless, no person will receive a pilots' license without at least some flights in a real airplane. However, with the help of flight simulators, flying airplanes becomes affordable for a larger number of people.

Even though the competitive landscape of an organization is not part of the business model (Osterwalder, 2004), it is briefly introduced to set the stage for the

following discussion. Ovelin attempts to combine a computer game with music instrument education. In a broader sense, Ovelin therefore competes with free time activities, offered by other organizations in the 'boredom killing business'. However, as will be discussed in more detail later, the target customer is a person that wants to learn to play the guitar, not necessarily one that is interested in gaming. In other words, it is not expected that people will buy guitars because they want to play the game, but rather people who have already a guitar or are intending to get one, may consider using Ovelin to support their learning process. Therefore, only offerings of other organizations in the music instrument education industry are considered in the competitive environment. However, a comparison of different possible competing products could be based on the two characteristics fun and education value as shown in Figure 34. In other words, some products may be more educative, others more fun, but StarEyes intends to combine the two into one product.

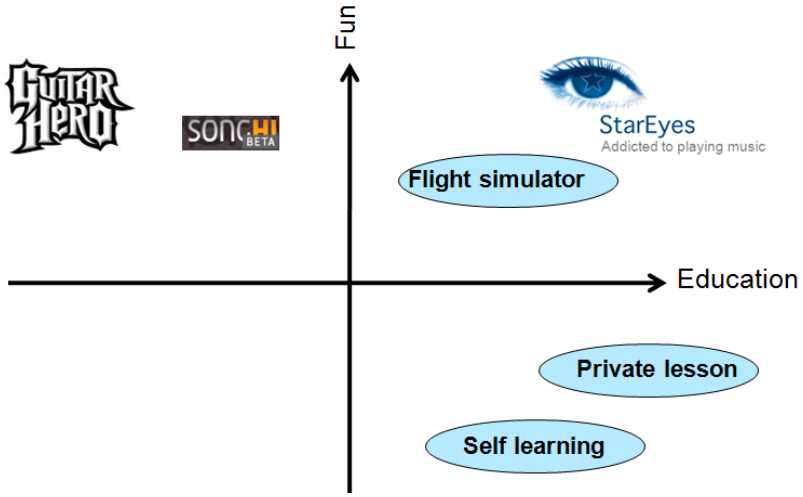

Figure 34. Competitive matrix for StarEyes.

Learning to play a music instrument has a long tradition and is considered a difficult (Motokava, 2006) but rewarding endeavor. There are essentially two different approaches to learn how to play a music instrument. The most common way to learn to play an instrument is through a personal instructor such as a music teacher, a member of the family, a friend, or at the school. A second way is to learn it individually, with or without the help of a self learning media such as books, DVDs, computer programs or information found in the internet. Table 18 summarizes different methods used to learn to play a music instrument and, according to a study in Germany, the percentage of people using each method (GFK, 2009).

Table 18. Methods of music instruction and corresponding percentage of users in Germany (GFK, 2009).

Method	Percentage
Individually	14.5
On the computer	0.1
Instruction by member of the family	8
Private lessons	61.2
Instruction in school	16.5
Band or orchestra at school	2.5
Instruction by a friend	2.6
No answer	1.7

As supported by the study in Germany, probably the most common method of music instruction is by private lessons. Learning under the guidance of a dedicated music teacher is in many regards advantageous, for example because of the instant feedback, and the ability of the teacher to customize lessons to the student's needs and preferences. However, this method is usually rather expensive and usually relies on regularly scheduled lessons. Nevertheless, one of the biggest advantages of private lessons is the continuous scheduled learning, and thus a motivation boost with every lesson. It can be seen as a golden rule, that playing a music instrument is all about motivation to practice. Table 19 summarizes some of the advantages and disadvantages of self-learning media (Casey, 2010) and private lessons (Yankowitz, 2010).

Table 19. Advantages and disadvantages of music instrument learning methods adapted from Casey, 2010 and Yankowitz, 2010).

Method	advantages	disadvantages
Self learning media	- Always available - Low costs - Learn at own speed	- No feedback - Limited to visual explanation - Little motivating incentive
Private lessons	- Personal feedback - Customized lessons - Motivating incentive - Gaining performance experience	- Costly - Fixed schedule - Dependence on teachers ability - Feedback only during lessons

While most of the advantages of one method are reflected as disadvantages of the other, a few become only significant when compared to a third method, for example a computer based system. Dependent on the implementation and the scope of its functions, a computer based music teaching method can overcome some of the disadvantages of private lessons, while its advantages and yet arguably being a self learning method. With the example of StarEyes, a case for an advanced computer based method is described following.

4.2 StarEyes as the Envisioned Business Idea

Founded in 2010, Ovelin is a Finnish start-up company aiming to change the way people learn to play a musical instrument. The company is the continuation of a project initiated by two students of Tampere University of Technology, which started in the end of 2009. The aim of the project was to investigate the technical feasibility and market chances of a computer based music instrument learning game. With this idea, the team behind Ovelin participated in and won a business idea competition (IIDA).

When the company was officially established in December 2010, Ovelin consisted of two founding members, three support members and a diverse group of advisors which support the core team. The founding members are Mikko Kaipainen and Christoph Thür, the latter being the author of this thesis. However, already since March 2010, the StarEyes team is using the Protomo innovation environment in Tampere and has further developed the business idea, the technology and the business model, which is subject of this thesis. In order for the reader to understand the thesis, the business idea called StarEyes is presented first. However, StarEyes is the long term vision that Ovelin plans to reach over several steps with intermediate products and thus different business models. The staging of these individual steps in the business model are an essential part of this thesis, and will be gone through step by step later in this chapter.

After the final version of StarEyes has been developed, a typical user experience of the computer based music learning game is described in the following example. The example illustrated in Figure 35 uses the example of a guitar as instrument.

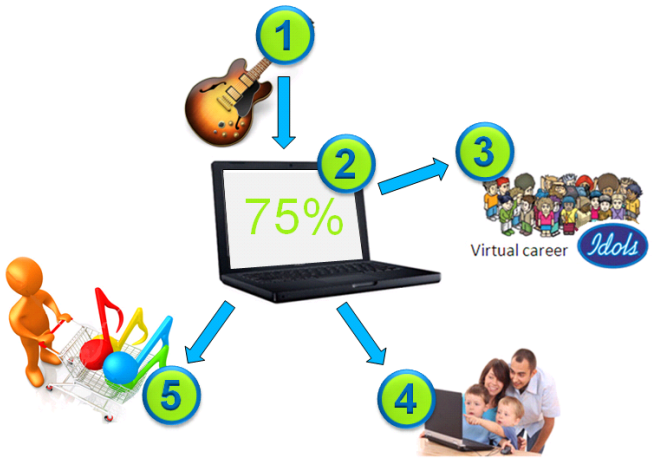

Figure 35. Typical usage of StarEyes: 1. connect instrument to computer, 2. play exercise and get instant feedback and score, 3. use good score to advance in music career, 4. show your skills to parents and family, 5. get exercises and songs from the online library.

First, StarEyes is started on the computer, and the user "connects" his guitar directly or with the use of a microphone. Since contemporary computers usually

feature a microphone, no additional equipment is needed. However, while the sound quality of standard microphones is sufficient, special instrument microphones or direct connection of electric guitars may yield even better results.

Second, the user then selects an exercise or song that is according to his taste and appropriate for his current skill level. The rehearsal plan is developed by music education professionals to create an intuitive, diversified and entertaining learning procedure. Comparably to a karaoke game like Sing star, the user plays required notes or chords as they appear, while StarEyes records the played notes. A possible visualization of such an exercise is shown in Figure 36, where a car has to be maneuvered through a race course by playing the correct chords at the correct time. These notes are compared to the original master recording, and the student is instantly shown where he played well and where further practice is needed. The audio recognition software evaluates timing of the played chord, as well as whether the correct chord was played and even how well it was played. Furthermore, an overall performance score is calculated, which result in a certain amount of credit points the user can use later.

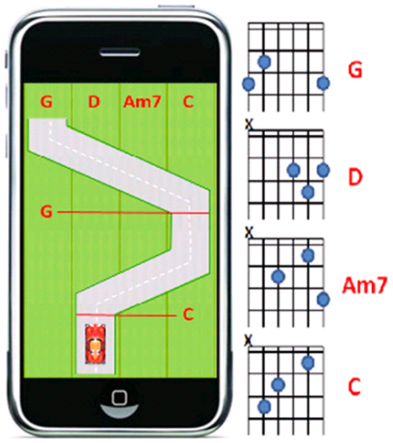

Figure 36. Possible visualization of StarEyes exercise used on an iPhone.

The student can practice the same passage as often as needed, to reach a passing score. Exceeds the student a certain passing score, more advanced exercises will become available. StarEyes is able to learn and understand from the user's skills and advancements, and is therefore able to give helpful tips and adapt the learning plan according to the user's preferences and needs.

Third, StarEyes features a role playing game, where the user aims for his avatar to become a successful musician. The storyline of the role playing game follows the path of a virtual music career from beginnings to eventually becoming a music star. However, in order to advance quickly in the career game, the user needs to deliver good scores from his music performance. In other words, only if his real life music performance increases, advancement in the game is possible. Nevertheless, the real

life skills required to achieve a certain status in the game are not strictly related to real life fame. In other words, even with rather basic guitar skills, a user can already gain "fame" in the StarEyes game, as illustrated in Figure 37.

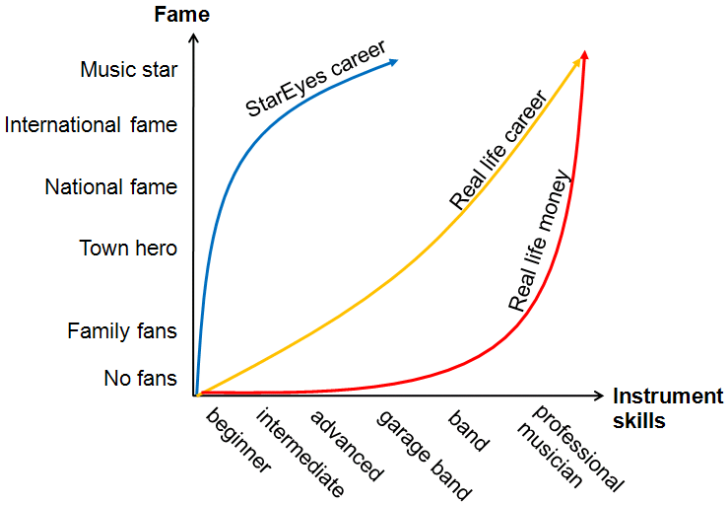

Figure 37. StarEyes "career" versus real life music career.

This element is also the main reason for the games name StarEyes. Like the rise of the sun is called sunrise, the rise of a (music) star can be said to be a star-rise. On the other hand, people that have what it takes to become famous are often said to have a sparkle, or star in their eyes. A third reason why the wordplay StarEyes is suitable as a name, because of the outdated underlying ideas both natural and music star phenomenon have. During sunrise, the sun does not rise, but rather the earth is turning. Of course the same is the case for stars. Similarly it may be interpreted by many people as if though a music star was rising, when in reality the media makes it appear as though the person was something special. In reality, and that is partly what StarEyes attempts to do, all you need to do is to turn the world around in the right direction, and any star can rise.

Because new options and applications in the career came become available with every level, the user is kept motivated to practice (drop-feeding). In other words, the games motivating features keep the users practicing and overcome those phases where exercises and therefore practicing on an instrument is usually still rather boring.

Fourth, after reaching a certain performance level, the user can practice with or compete against other players of StarEyes, participate in castings, concerts and other activities. In other words, the career game approaches more a virtual reality environment like Habbo hotel, while leveraging the popularity of social networks like Facebook. The platform enables people to find users with similar tastes and complementing skills, to form groups or organize music jam sessions, online and in real life. Furthermore, users can and are encouraged upload and share songs they

performed in, and show how their skills improved. Like this, the user can receive more credit points required to advance in the career game. Users receive performance points if their performances are viewed by other StarEyes user or also non users, for example their parents. In other words, the more friends come to see a user's performance, the more performance points this user receives. The viewer himself too receives experience points for viewing different performances. This could be termed as induced interactivity, since the users are encouraged to share their performance as well as see and comment on other user's performances. Sharing performances and being proud of how ones skills and thus virtual career improves gives the users one more important motivating feature. On the other hand, this can also be used as a marketing tool for StarEyes that could be termed induced word of mouth, since the person sending links to StarEyes homepage is actually being rewarded for his suggestion. Parents on the other hand have a chance to follow their children's development in an interactive and fun way.

Fifth, songs and exercises can be downloaded from the StarEyes library. The vision of Ovelin is to enable free basic music instrument education for everyone. This means, that when the product reaches the final StarEyes stage, all services of StarEyes are free to use for anyone. Furthermore, basic exercises at all difficulty levels are paid for by credit points earned in the game, and therefore too do not require payment of real money. The exercises in the song library are assorted according to instrument and level of difficulty. Also real song exercises can be downloaded from StarEyes song library. These files include the complete song as audio file, but also separated tracks of all music instruments. Usually songs are recorded in a way, that the track of each sound source separately, one for guitar, one for piano, one for the voice, and so on. Those separate tracks are available to the user, and he can just “replace” one track with his own performance. This enables the user to become a virtual band member of his favorite real life bands. However, unlike all other services, these songs have to be paid for, for once to cover the artists' royalties, but also to finance StarEyes.

The sale of songs through StarEyes opens up an entirely new opportunity for musicians, record companies but also individuals to sell their songs. The great advantage for the music owner is that the selling platform is tied to the platform where the file is used. In other words, StarEyes knows if a user bought a particular song. Although illegal download of such files is possible, they cannot be used in StarEyes to practice, and thus to advance in the game. This circumstance embodies a situation the music industry has been desperately searching for to countervail against music piracy. In StarEyes companies and individuals can sell their songs in a way that secures the copyright owner's exclusive rights. Charging a fee for each sale is one of the major sources of income for Ovelin once the StarEyes stage is reached. However, the intermediate steps in the product development as well as the revenue logic of StarEyes are discussed in more detail in this chapter.

For StarEyes, the music exercises are broken down into small independent sessions. Each session takes the average player 30-60minute to master, if he has mastered the previous exercise. By packaging the exercises into small sessions, they become game levels that can be mastered after a few trials, instead of the extensive exercises students are often given when taking private lessons, and that often take several hours to master. This technique allows the user to have small moments of success by monitoring his progress. At the same time, the visualization of the exercises is much different than that of classical music notation. It is placed in an attractive game environment, which is in accordance with more modern music tuition approaches.

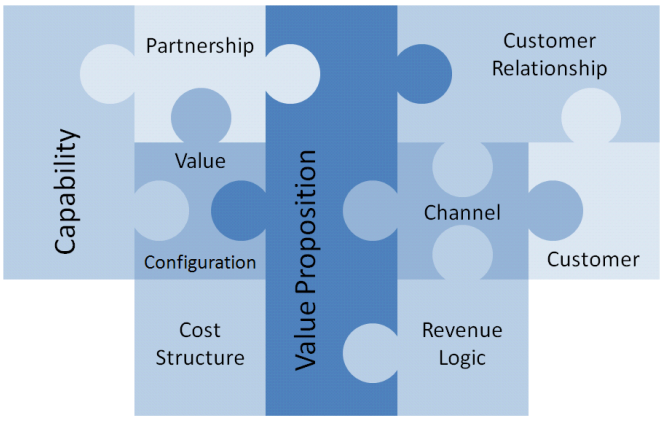

Figure 38. Visualization of anticipated business model for StarEyes.

The above summarizes the initially envisioned product called StarEyes, and describes loosely the anticipated "ideal business model", as symbolized in Figure 38. Obviously much is based on hypotheses that have not yet been proven. However, it can serve as a good vision for a company to aspire towards, while learning and updating as the business develops and lessons are learned.

4.3 Risk and Uncertainties of StarEyes

The development of the entire computer based music instrument learning game envisioned in StarEyes requires an enormous amount of work, testing and financial resources. However, from a technological viewpoint, only the sound recognition and analysis of polyphonic audio signals is new. The other elements for StarEyes such as the role playing game, virtual world and online library are, through expensive to implement, commonplace from a technological point of view. Therefore, only the technological background of the polyphonic audio signal processing is briefly introduced here. From a technical point of view the key challenge to implement StarEyes lies in the advanced audio recognition and signal

processing. Similar to games like Sing Star, the "game controller" of StarEyes is a microphone. This allows users to use any acoustic or even electric guitar without the requirement of additional equipment. Therefore, the whole concept of StarEyes relies on the ability to accurately and reliably recognize and evaluate the audio signal created by the chords and notes played on the guitar.

There is an enormous difference in the analysis of audio signals between monophonic instruments that produce one pitch at a time (e.g. wind instruments, human voice) and polyphonic instruments that can produce multiple pitches at one time (e.g. guitar, piano). Each of these pitches causes not just one frequency peak, but a so called frequency comb formed by the fundamental frequency (F0) and its harmonics in spectra as shown in Figure 39.

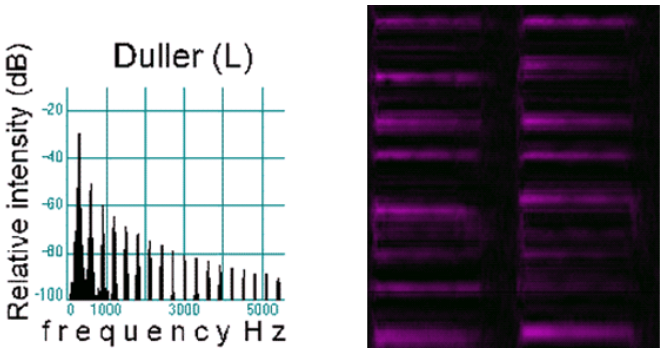

Figure 39. Frequency comb of single pitch (left) and 6 pitch chord (right).

Because of the up to six overlying and unevenly spread frequency comb signals, the recognition of polyphonic signals is much more difficult than the recognition of monophonic signals. This obstacle was overcome by utilizes Klapuri's *pitch salience* which is a time-frequency representation that is a rather sophisticated piece of signal processing (Klapuri, 2006).

To date, Ovelin reached several milestones form a technical implementation, as well as business point of view. Figure 40 shows the development of Ovelin from the initiation of the StarEyes project in the beginning of 2010 to the establishing of the company in the end of the year.

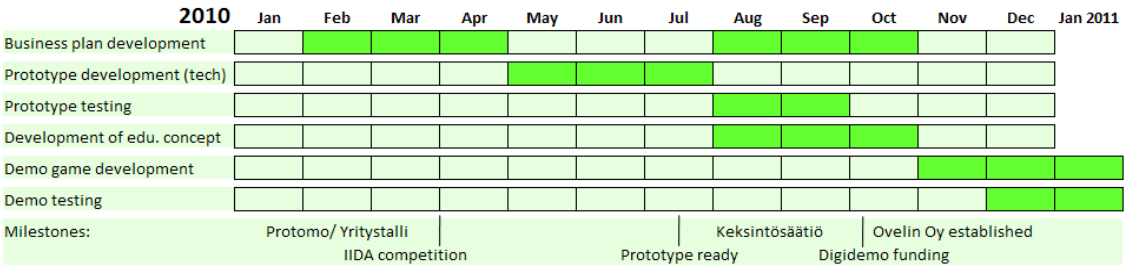

Figure 40. Development plan of Ovelin in 2010.

During summer 2010, Ovelin has developed a prototype of the real time chord-processing program suitable for first user testing, as shown in Figure 41, together with its partner organization Wavesum Oy. The program can be used with a standard computer microphone, and works for a normal acoustic guitar as well as an electric guitar.

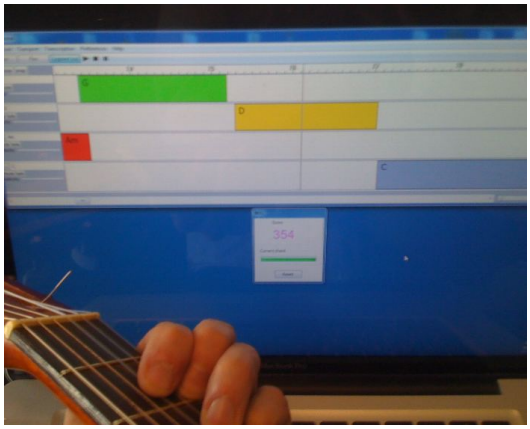

Figure 41. Prototype of real time chord processing program with color coded feedback for performance level.

Based on the technology developed for the prototype, a demo version of the game has been developed together with five students in the Demola surroundings of Tampere based New Factory's open innovation environment. The demo utilizes as visualization animals representing chords, for example Carsten the Crazy Crocodile represents the C-major chord. The storyline of the game follows loosely the old German tale of the Piped Piper of Hamelin. According to the tale, the piper once rescued the city from a rat plague by playing them into trance with his flute, so they would follow him out of the city and over a cliff. However, the animals of StarEyes react to different specific chords and notes played on a guitar. Therefore, Giuseppe the Guitarist is going through the streets to collect the other animals, as shown in Figure 42.

Figure 42. Screenshot of WildChords demo game: Crocodile = C-chord, Ape = A-chord.

This demo version can already be used for extensive user testing for the first stage of the StarEyes project. It marks only the very beginning of the Business Model Evolution implementation plan of StarEyes, as will be discussed following.

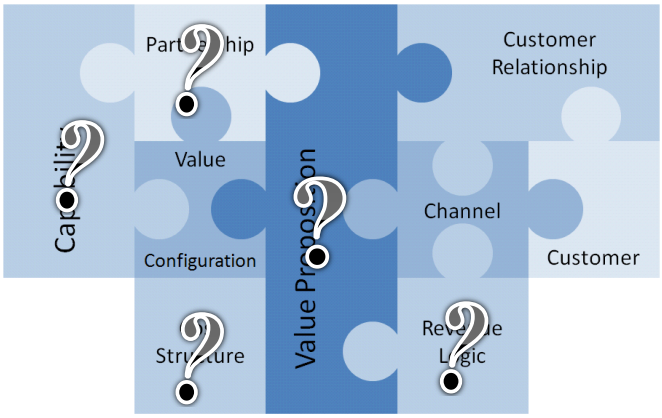

Figure 43. Identified major risks and uncertainties in the StarEyes business model at the initiation of the venture.

Most new ventures carry risks and uncertainties, especially ventures that include new technology, and introduce an entirely new way of solving an old problem. However, while most elements of a business model are eventually adapted and modified as the project develops, some areas are subject to much more severe uncertainties. Figure 43 visualizes the specifically identified major risks and uncertainties at the point when the venture was initiated.

4.4 Planned Business Model Evolution

A computer based music instrument learning game using the polyphonic audio recognition technology can come in the form of a simple application that evaluates individual chords. However, the technology can also be used to build develop an enormous platform with a multitude of functions, interactive features, an extensive song library and even an adjacent virtual world. While the former describes the first phase currently being developed under the name WildChords, the latter is the ambitious long-term goal called StarEyes. The advantages of an entire virtual reality package over a simple application will be outline throughout the discussion. However, establishing the business model developed for StarEyes is an undertaking that requires high investments in time and money, and contains considerable risks.

Therefore, the business development is split into reasonable sub-projects, each building on the achievements of the previous stage, and each in itself a sustainable business model. In other words, Ovelin can be seen to develop six products, while each is built on the previous developments through a process of creative destruction. With such an approach, the risk concerning market acceptance as well

as that of possible imitators is largely reduced. Furthermore, by realizing the first phase of Ovelin as a comparably small project, the financial situation of a start-up company is met, while flattening the path for the more elaborate goals. Table 20 shows the different planned stages from the initial rehearsal game to the ambitious full version of Ovelin.

Table 20. Project phases of Ovelin.

Stage name	**Description**
WildChords	- Standalone application - Evaluating guitar exercises
Song exercises	- Real songs as background - Visualization adapted to individual song
Career game	- Progress built into career simulation - Personalization of career and avatar
Virtual world	- Interactive game with other players - Competitions, user based evaluation, recommendations
Song library	- Content development outsourced - Content assorted according to difficulty level
StarEyes	- Multiple instruments - Real life applications

The four intermediate project phases between WildChords and Ovelin are each built individually sustainable business models that build on the predecessors' development. In other words, each of the phases marks a considerable advancement over the previous situation. In the following discussion, the entire business model is only laid out thoroughly for the first phase, while in each following paragraph only the significant changes over the previous phase are highlighted. While more than one phase can be developed at the same time, no phase can meaningfully be implemented precursory or skipped completely. For example the Virtual Music Career and Music World phases are planned to be implemented simultaneously. After an initial description of each phase, the relevant business model building blocks are discussed and summarized in a table at the end of each paragraph.

The first phase of Ovelin, termed WildChords, is a standalone application that supports the user practicing specific exercises on the guitar. An exercise consists of a certain sequence of chords which the user has to perform. Similar to a karaoke game, WildChords presents the sequence of required chords the user has to play, along with a background track. Depending on how well the and timely the chord has been played, the program gives instant feedback to the user, while cumulating the points for each chord. If the user has gathered more points more points than the passing score until the end of the exercise, a subsequent exercise slightly more difficult will become available. In the case of less point than the passing score, the user tries the same exercise again. Before moving to the first evolution process, the anticipated business model of StarEyes is summarized in the following table and Figure.

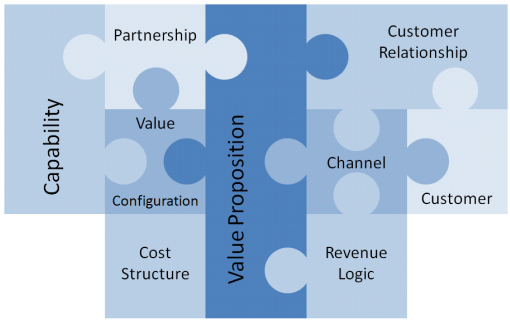

Figure 44. Visualization of anticipated business model for StarEyes

Table 21. Summary of WildChords Business model (Stage 1).

Business Model building block	**Description**
Value Proposition	**Reasoning**: use, reduced risk, reduced effort (and perceived effort) **Value Level**: Me-too, innovative imitation, innovation **Price Level**: Free, economic **Life Cycle**: Creation, purchase, use, renewal, transfer
Target Customer	**Criterion**: Interest in guitar, age, interest in games/online products, Technical requirements, geographical
Distribution Channel	**Channel**: Online, Instrument stores, music teachers
Customer Relationship	**Customer equity**: Acquisition, retention, add-on selling **Function**: Personalization, trust, brand
Value Configuration (Value Chain)	**Inbound logistics**: User data, Exercises, audio inputs, user feedback, user leads, payments. **Operations**: availability, progress visibility, exercise development, competitions **Outbound logistics:** Product availability, real time feedback, learning material availability, progress visibility **Marketing + Sales:** Enable payments, approach leads, collaboration, general marketing **Service:** Respond to feedback
Capability	**Tangible:** basic and specific equipment (musical equipment) **Intangible:** Licensing agreement, patent (study ongoing) **Human:** Management, Technology, Music and Education, Marketing, Legal
Partnership Network	**Planned partnerships:** Audio Technology, game development, marketing, patent application, Office space, fundraising,
Cost Structure	**Product development (ext.):** Audio and game: 40% **Product development (int.):** specifications and management: 10% **Operations:** Salaries, other costs: 30% **Marketing:** campaigns: 10% **Other costs**: Taxes, overheads, buffer: 10%
Revenue Model	**Revenue Streams:** free usage, pay per exercise, premium subscription

The progression of exercises is designed in such a manner, that each exercise is just slightly more difficult than the previous one by, for example, introducing a new chord or increasing the pace slightly. This technique, in the gaming industry called drop-feeding, is used to keep the user motivated to keep on going, since the goal is just out of reach. A second approach taken from the gaming industry is placing the exercises in a context with a story. The aim is to extend the motivating incentive of the game so, that the user wants to master an exercise not only for the exercises sake, but also to learn the continuation of the story. In other words, the user is motivated not only to practice harder on each exercise, but also to continue to the next exercises. As for now, the story of the animals in the city, and a neutral visualization are planned at this phase.

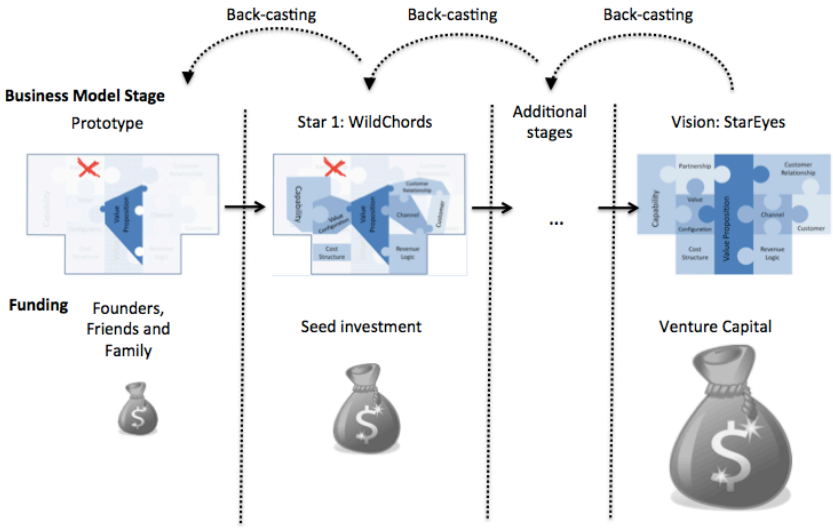

Figure 45. First stages of Business Model Evolution from prototype to WildChords and eventually to the StarEyes vision.

Figure 45 is a visualization of the first stage of the Business Model Evolution, showing the prototype stage, the anticipated second first Business Model Stage (WildChords), and the eventually anticipated StarEyes model.

5 WILDCHORDS AS INITIAL BUSINESS MODEL

5.1 VALUE PROPOSITION OF WILDCHORDS

The first prototypes of WildChords were built for the Windows operating system. While the development is obviously not strictly divided into a first planning phase, and a subsequent execution phase, at the time of writing the first part of this Thesis (March 2011) the plan summarized in the Table 21 was the best estimate the Ovelin team had at the time, and was aiming to implement. While WildChords does not include many of the features and elements the overall vision of StarEyes would include, the team was still convinced that with this first product a profit could be made on which the next stage of the product could be financed with.

A computer based music instrument learning game may derive value mostly through use, but also through the reduction of risk and effort. WildChords, as arguably most other products, derives its value mainly by its *use*. Compared to the two other methods of music education, private lessons and self learning, the use of WildChords combines most of their advantages, as shown in Figure 46.

As a standalone computer program, WildChords can be used at any time suitable for the user and for as long as the user desires. Unlike with a self-learning book or DVD, the user is given instant feedback about his performance. Since the evaluation is only based on the audio signal, the feedback is rather limited to how well a chord is played, while other important attributes such as the fingering technique cannot be commented on. However, unlike a teacher who may be biased or in a bad mood, the feedback is unambiguous. In other words, the judgment of a computer program is neutral and "honest". Another important possibility of a computer-based system is its motivating features. To keep the user motivated to keep practicing within an exercise, the drop-feeding approach explained previously can be deployed. Furthermore, to keep the user motivated over a longer time period the exercises can be implemented into a background story that continues with every successful completion of a level. Drop-feeding and a background story is an excellent example of the richness of digital products, since it is not possible in a self learning media, and can be hardly imagined to be incorporated by a music teacher. While a computer based system has every means of self learning media to show and explain music theory, fingering techniques and exercises with video, audio and animations.

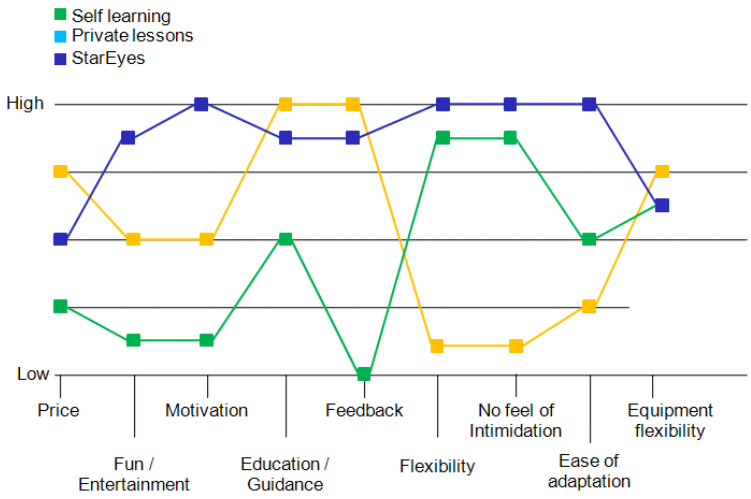

Figure 46. Value Proposition of WildChords compared to self-learning and private lessons.

However, Ovelin is not the only organization that is moving into the field of combining music instrument learning with computer games. For example, while Guitar Hero and Rock Band were clearly computer games that allowed users to feel like rock stars, their newer version games feature six string controllers that can be played like a real guitar. The very popular Guitar Hero series has used a guitar shaped controller to give the user a feeling of being a rock star. These products can be said to be rather far away from a product like StarEyes and only compete very marginally. However, Power Gig and Harmonix have released during 2010 a version of their console game that is played with a six-string controller. While still being made of plastic, the controllers are real “guitars” that are suitable to actually play.

However, these games were apparently made only for people who already do play the guitar very well, and do not feature much learning or motivating concept. One commentator said about the game that “Just know that buying it for your kids or significant other won't magically teach them to play, any more than a new computer will inspire them to program”. Griffin McElroy of Joystiq referred to the game and its guitar controller as "a dumbfounding product...[centering] itself around a peripheral which is a real guitar, yet it doesn't allow the player to use the real guitar as if it were a real guitar. Instead, it settles for using a new toy to manipulate an old game -- but still manages to categorically fail at both". In any case, one main disadvantage of these products is, that it requires a game console, and that a special guitar has to be bought that costs roughly the same as a real guitar. For WildChords on the other hand, any guitar and a normal computer will do. A comparison of WildChords and the Guitar Hero products can be found in Figure 47.

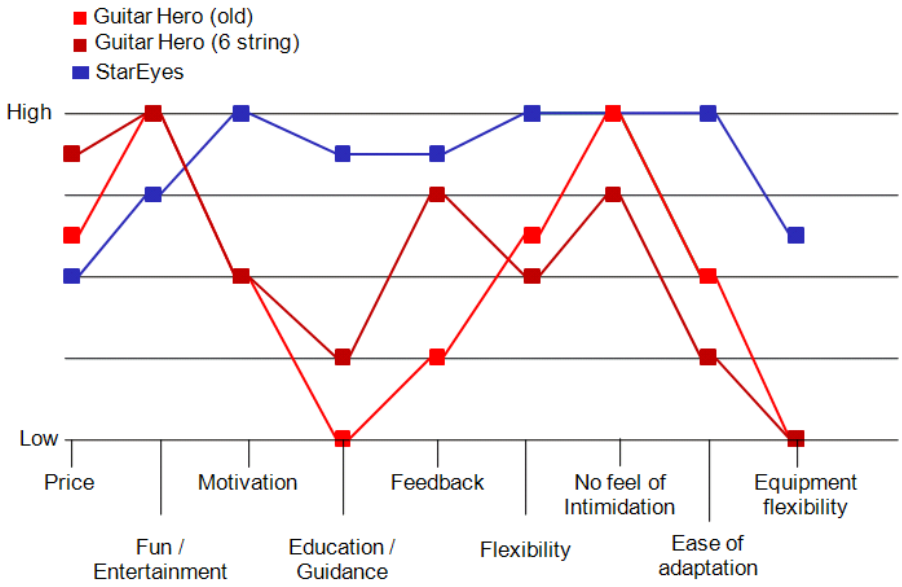

Figure 47. Value Proposition of WildChords compared to Guitar Hero products.

Due to the ease of storage and retrieval, the user's current status can be stored and made available over time. In practical terms, this means that the user gets an overview over the time he practiced and how his skills advance. This marks another big advantage in motivation over the traditional methods, since improving skills is often perceived by the individual as stagnating, while in fact a progress is slow but continuous. Finally, due to the ease of enrichment of digital products, new and more difficult exercises can be made available, once the user has mastered the first lot. Furthermore, the functionality of the program can be extended from one exercise type, chord recognition, to other exercises such as picking, solo guitar or strumming patterns. Therefore, a computer based music instrument learning game can accompany a student's practicing from a beginner to an intermediate level of skills, as discussed in the section about target customers.

Despite the reasoning based on the use of WildChords, such a product also derives its Value Proposition from a *reduction of risk*, as compared to the two other methods. Due to the ease of distribution and extension, a computer based system can offer trialability and granularity like a private lesson, but usually not a self learning method. Compared to a self learning medium, one can take a trail lesson of a music teacher, to see if it is suitable. Some teachers even give these lessons for free. However, the social norm of reciprocity may oblige the student to stay with the teacher, even if he has not been fully satisfied. To avoid the previously stated risks for the users, a basic version of WildChords with few exercises is made available for free, giving the users the opportunity to test the product before purchase. In other words, the user only buys what he has tested and is satisfied with. Therefore a user does not have to buy a pig in a poke like in the case of other self learning media. Furthermore, unlike a self learning DVD or book, in WildChords the user is able to only buy subsequent exercises if he has been satisfied with the previous package.

A computer based system may also create value through the *reduction of effort*, additionally to value of use and the reduction of risk. Here, a distinction between actual effort and perceived effort can be made. WildChords reduced the actual effort compared to private lessons, since it can be used at home without travelling anywhere. However, the more important part is the reduction of perceived effort. As all beginnings are difficult, so is beginning to play a music instrument. Even though it is meant to be a hobby or pleasure bringing free time activity, the initial steps are usually considered to be tiring. In other words, for some people it takes a lot of effort to practice on their instrument until they reach a certain level where playing becomes fun. A significant part of people starting to play an instrument quit practicing in this early phase, because practicing is perceived as effort, and can therefore reduce the initial motivation. If a product can remove the perception of effort, even without reducing the actual effort, sugaring the pill, it creates value. For example taking a good book onboard an airplane does not make the airplane fly any faster, but it does make the journey appear to pass more quickly. Computer games make people invest enormous time handling a game controller, an activity otherwise rather useless and rather boring. By combining game features with the development of guitar playing skills, WildChords can reduce the users' perception of effort during the initial time of practicing. This reduction of effort can also be seen as part of the value through use. A summary of the reasoning behind the Value Proposition of WildChords can be found in Table 22. Reasoning behind Value Proposition of WildChords

Table 22. Reasoning behind Value Proposition of WildChords

REASONING	Why Ovelin thinks StarEyes could be valuable to the customer
USE (see business idea)	• learning of a worthwhile skill • instant feedback and motivating features • ease, flexibility and low cost of use
RISK	• *trialability (try before purchase)* • *reduced up-front costs for special equipment (console)* • *reduced risk of obsolescence (guitar maintains value)*
EFFORT	• *no driving to lesson (usually the parents)* • *suitable exercises are suggested (reduced search efforts)* • *reduced perceived effort (if it's fun, it's not effort)*

A second attribute of the Value Proposition is the Value Level. It describes how the customer value of the offering compares to the offerings of competitors. As was discussed previously, WildChords combines several advantages of self-learning methods and private lessons. Therefore, it can be said to be in the "*Me-too*" level with many of the elements of the other two methods. One element of *innovative imitation* can be found in the fact that the exercises have been designed to appear like game levels. These "levels" are short enough to keep the user motivated to start practicing often, even if only for a short while. Furthermore, each level is only

slightly more difficult than the previous one, so that it can be mastered after only a few trys.

The innovation in WildChords comes in the combination of a game and a tuition program, where new chords or techniques are introduced with very light theory that does not make the user feel like being at school. Furthermore are the visuals and the whole surrounding taken away from the strict musical notation that allows the user a more intuitive and fun approach to music. The second element of innovation is the usage of polyphonic signal processing technology. Unlike other products like the Guitar Hero series, WildChords relies on audio signal processing. This means that the actual played sound is what is evaluated, not the way it is produced. This allows the user to use any kind of guitar, and any kind of computer. In other words, no additional equipment than a guitar and a standard computer is required to play StarEyes. A summary of the value level can be found in Table 23.

Table 23. Value Level behind Value Proposition of WildChords.

VALUE LEVEL	How StarEyes compares to other guitar learning methods
ME-TOO	• Basic guitar lesson tuition and exercises
INNOVATIVE IMITATION	• Transform music exercises into game levels
INNOVATION	• Combine game and tuition program • Polyphonic signal processing (guitar)

The high costs of music education can be a big barrier for many people who want to learn to play an instrument. Compared to private lessons, which often are located in the premium segment, WildChords is very competitive and may even be played for free. The premium monthly subscription costs about four times less than taking private lessons, while no additional material like books have to be bought. However, for people that are not willing to pay for the service, a limited version is available for free. In this version, however, users who finish one free exercise have to wait one week until the next one becomes available. A summary of the price level can be found in Table 24.

Table 24. Price Level for the Value Proposition of WildChords

PRICE LEVEL	Price level of StarEyes compared to competitors
FREE	• Free version (time limits apply)
ECONOMIC	• Monthly subscription ¼ of private lesson price

The last attribute of the Value Proposition, the Life Cycle, indicates at what stage of the product life cycle WildChords creates user value. WildChords already creates value during the *creation* of the service, since the user can chose what kind of learning path is according to his skills and taste. When buying a self learning DVD, the procedure is given, and also many music teachers might simply run their

"standard" repertoire. The value added during *purchase* is, that first, the user does not need special equipment, and that the product can be bought online. The second value created in the purchase is that the product can be tried without risk for free, and also enables the user to only use and buy the exercises he really wants to use. Yet, once the user is buying many songs, an upgrade to the premium monthly subscription is easily possible. The value created during *use* has already been described above. The value created during *renewal* is that the program suggests what exercise would be suitable as a next exercise, making the decision for the user easier. Furthermore the mostly young users can ask for sponsorships from their parents or relatives. Finally, when *transferring* to a new product, not only the skills that were learned maintain value, but also the equipment (guitar) itself. A summary of the price level can be found in Table 24.

Table 25. Value creation during life cycle of Value Proposition of WildChords

LIFE CYCLE	At which stage of its life-cycle StarEyes creates user value
CREATION	• User can chose learning path according to own taste
PURCHASE	• 3 step pricing level (free, selected exercise, subscription) allows smooth transition from free tester to premium user
USE	• see value proposition / business idea
RENEWAL	• Monthly subscription available • Users can ask for sponsoring (e.g. from parents)
TRANSFER	• required equipment (guitar) maintains value

As WildChords is only the first stage towards the anticipated StarEyes business model, its business model is less developed as shown in Figure 45.

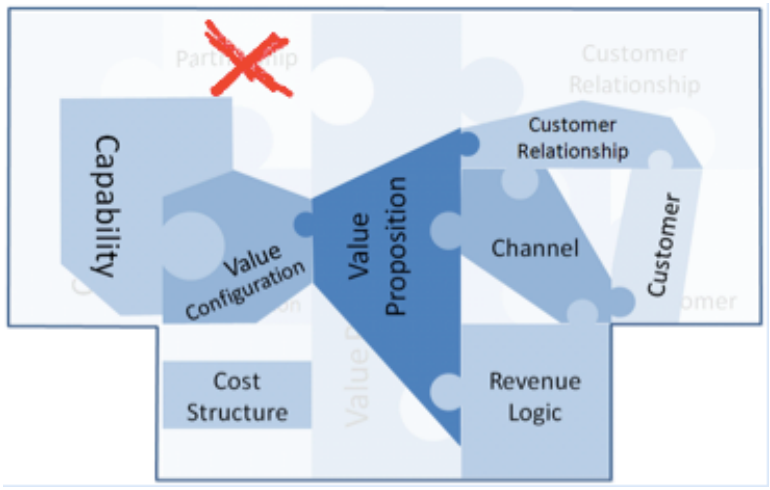

Figure 48. Business model framework visualization for the first stage, WildChords.

The partnership network for example is not yet available in this stage, and also much of the value proposition is not yet available. This of course has an effect on the possible target customers, and translates into all the other building blocks.

5.2 TARGET CUSTOMER OF WILDCHORDS

The target customers of WildChords can be selected based on one main criterion: the interest of learning to play the guitar. According to a representative survey conducted in Germany, the guitar is the second most played music instrument, after the piano as shown in Figure 49 (GFK, 2009). The target audience of WildChords is people that are actively engaged in a learning process to play the guitar, and especially beginners. The same survey found, as expected, that the majority of people are children and teenagers that start to play a music instrument as shown in Figure 49.

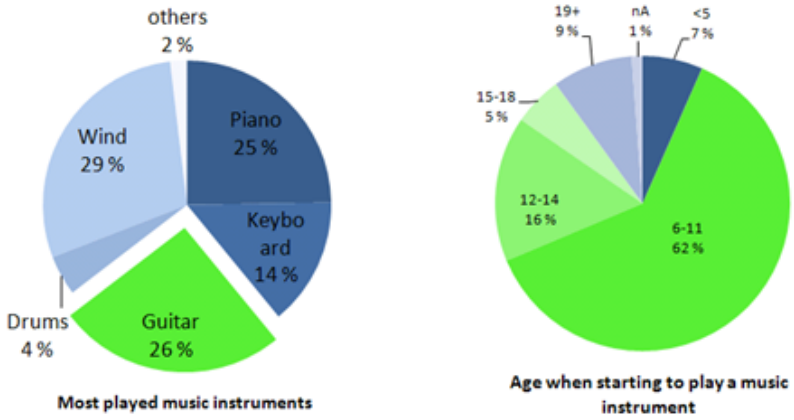

Figure 49. Distribution of most played instruments (left), distribution of age when starting to play a music instrument (right).

While the dominating attribute of the target audience is the interest to learn how to play the guitar, the user of a computer based music instrument learning game also should be able to use basic computer programs and ideally enjoys using computers and playing computer games. As luck would have it, additionally to their interest in playing music instruments, children and especially teenagers are regularly using computers and surfing in the internet. In the US, 93% of 12-17 year old teenagers use the internet regularly (Pew research centre, 2009). In other words, the vast majority of people at least in the US and EU that start playing a music instrument have the option to use Ovelin.

The survey conducted in Germany revealed that 36,8% of the population play or learn to play a music instrument (GFK, 2009). This figure corresponds to the estimate by a local music school in Tampere. Another study by Gallup estimated a total number of at least 84 million individuals that play a musical instrument in the US (Lyons, 2003). These numbers suggests that around one third of the population in the western societies play or learn to play a music instrument. For the market estimation of Ovelin, this group is further subdivided into five groups, according to their learning activity. The percentages, as shown in Table 26, are based on the German survey. The typical user of WildChords is in the group of learner,

particularly the self-learner, estimated to be 4.2% to 13.2% of the population in western societies.

Table 26. Current situation of population in Germany regarding learning or playing a music instrument (GFK, 2009).

Group	Description	of players	of total*
Self-learner	People using self-learning methods (book, DVD)	12.5%	4.2%
Teacher-learner	People taking music classes (teacher, friend)	26.9%	9%
Musician	People not anymore in any learning process	60.6%	20.2%
Music-dreamer	People wishing to play a music instrument		31%
Music-avoider	People with no interest of playing an instrument		33%
n.a.			2.6%
Total		100%	100%

* calculated with a figure of 33% of population playing or learning to play a music instrument.

One of the most important attributes of this segment of young customers is that the user and the paying customer are in most cases not the same. In other words, the children play while the parents pay. According to a 2008 poll, parents are present when a computer game is bought or rented in 94% of the cases (Entertainment Software Association, 2008). Furthermore, in 88% of the time, parents report that they always or sometimes monitor what their children play. In the case of violent computer games, this may be a disadvantage for the sellers, however in the case of Ovelin, this can be seen as a great advantage. The attitude of the parents towards learning a music instrument is very high. Around 80% of parents hope that their child learns to play a music instrument. In other words, it is probably rather easy for a child to get their parents approval to spend money on music education. A summary of the criteria describing the target audience can be found in Table 26

Table 27. Criteria describing target audience of WildChords.

CRITERION	Who and why users chose StarEyes
INTEREST IN GUITAR	• beginner in guitar playing (or general interest in guitar) • some connection to guitar (e.g. Parent plays, have guitar at home, likes rock music)
AGE	No specific age focus in general, however, typical user is • children and young teens (6-14y) • game also suitable for older audience (not childish)
INTEREST IN GAMES / ONLINE PRODUCTS	• Users may like games, online games and social networks • However, a typical user is a user, not tech- freak or hacker (knows how to use basic robust simple programs)
TECHNICAL REQUIREMENTS	• Access to internet (to download program and exercises) • Ability / willingness to pay online content • Access to basic equipment (PC, later Mac, Iphone, Ipad,...)
GEOGRAPHICAL	• First markets: Finland, Great Britain, Germany

A second possible target audience for such a product would be seniors, notably the baby boomers that are currently reaching the retirement age, that want to start a new hobby and learn to play an instrument. Developing a similar product for different instruments such as wind instruments and others that are popular in this target audience, would not be very difficult, since most of these are monophonic instruments. Furthermore, this audience would have the means to pay a premium price for such a product, which on the other hand would also require the program to be developed already to a very high standard in the first version. However, the use of internet and especially computer games, and the willingness to pay for a purely digital product are very uncertain. Furthermore might it be easier to move from a "cool" tool for teenagers to a more serious learning tool for adults, than to try to sell a "senior learning tool" to teenager. However, the move to such a target audience might be considered in the long run. This is also the reason why the founders have chosen to take the rather neutral name Ovelin Ltd, rather than the somewhat distinct name StarEyes, that clearly conveys a message targeted to a younger audience.

WildChords qualifies for pure electronic commerce, since the product itself is digital, the delivery is through the internet and also transaction processes are handled digitally. In other words, the channel LINK is the internet.

However, seeing the internet as a distribution channel as one entity, would not be taking into account the different possibilities available today. A digital product can be offered on a company's homepage for download. However, the growing popularity of application portals make them increasingly attractive for digital products. What particular channel within the internet is chosen, depends strongly on the platform and device the system is offered. Being a game that does not require any special input channel but a microphone, WildChords would qualify rather well as an application for internet and multimedia-enabled smart phones, as well as the rather novel product family of tablet computers. These products and especially applications for them, so called apps, are currently rather popular. Because of their popularity, digital distribution platforms for mobile devices such as App Store and Android Market represent an attractive channel link for WildChords. Furthermore, many media channels run app testing and recommendation shows which represent an attractive means to attract attention and gain publicity.

However, the target audience for WildChords and that for smart phones and table computers do not overlap much. In other words, access to a smart phone or tablet computer is for children and teenagers, the target audience of WildChords, still rather limited. A summary of the channels used to make WildChords visible and available to potential users is given in Table 28.

Table 28. Channel links used to make WildChords visible or available to potential users.

CHANNEL (LINK)	How the users get and use StarEyes
ONLINE	• StarEyes is web based product running on browsers, and thus on all major devices and stores • Devices: PC, Mac, smart phones, tablet computers • Market places: Webpage, App store, Ovi store,...
INSTRUMENT STORES	• Use StarEyes as additional sales argument (if your kid has motivation problem, StarEyes could be a solution) • StarEyes shows potential users with no access to a guitar, which music stores in the area let him try StarEyes (and subsequently sell him a guitar)
MUSIC TEACHERS	• Students with low motivation to practice can be advised to use StarEyes to rehearse at home • Teachers are able to build their own "learning plan" in StarEyes to supplements their private lessons. Therefore, teachers can render better service, and above a certain number of sales from their students, teachers can benefit financially

The main link between Ovelin and its customers is through the internet. Therefore the acquisition of WildChords is comparably easy since the user can download a trial version of the program from the internet for free. This allows a prospect to test the product before purchase and thus reduces the risk of miss purchase. However, neither the full functionality nor the full content is made available for free. Content wise, only a selected number of chords and a small number of exercises are available in the trial version. From the viewpoint of functionality, the trial version does not allow loading new or creating own songs. When the user reaches the last level available in the trial version, he is invited to unlock the remaining content and functions for a fee. Furthermore, there are several different exercise packages available the user can choose from. For the user this reduces the risk of buying exercises that are not appropriate, while Ovelin has a means of personalization and retention of the users. Furthermore, the user's efforts of comparing difficulty levels of different exercises are reduced, since all exercises use a standardized notation of difficulty. The follow-up exercise suggestions of WildChords are always suitable for the particular user. In other words, WildChords knows the skill level of the user very well, and can suggest the next package of exercises once the previous exercises are all mastered.

Two additional links between users and Ovelin can be utilized to increase the awareness while strengthening trust and brand. One link is through music schools and teachers, and a second link is related to music instrument manufacturers over the music stores. Music schools and teachers can be approached to test and suggest WildChords to their students. Additionally to the trial version free to any user, users that were recommended to use Ovelin products by their music teachers and schools receive an additional set of exercises for free. The music teachers have the advantage that their protégés potentially practice more regularly and longer

between the lessons, while hopefully also enjoying playing the instrument more. While teaching students at a more advanced level usually makes the work for the teacher more interesting. Students who enjoy practicing more and whose skills advance fast may also help building their teachers reputation which in terms may lead to more customers. Furthermore, sharing part of the revenue generated by these students between Ovelin and the respective teacher may be considered to motivate teachers to suggest WildChords. Ovelin on the other hand may reach more potential customers, while building a certain level of trust and brand may be achieved through association with music schools.

The second additional link between the user and Ovelin is through music instrument manufacturers, particularly guitar manufacturers. Guitars are complementary products to WildChords, since they can be seen as the required game controllers of the game. Therefore, when purchasing a certain instrument, the buyer can receive an additional set of exercises for free. Guitar manufacturers can add additional value to the sales of a guitar, while Ovelin in terms again may reach potential prospects. Furthermore, the association with respected instrument brands helps Ovelin building trusted and especially a quality brand for its products. A summary of the customer equity through the relationship can be found in Table 23 and the function of the relationship in Table 29.

Table 29. Customer equity through relationship with WildChords users.

CUSTOMER EQUITY	How StarEyes connects and relates to it's customers
ACQUISITION	• Targeted marketing campaign • Induced word of mouth (users can compete with friends and famous people, get free exercises for new customers) • Promotion through teachers and music instrument stores • Guerrilla marketing (combined with background story)
RETENTION	• Unique product (no direct substitutes) • Exercise suggestion based on preferences and current skills
ADD-ON SELLING	• Additional exercises (for non-subscription users) • Additional equipment (guitar microphones, digital distortion) • Real songs (guitar track muted, see implementation plan)

Table 30. Function of relationship with WildChords users.

FUNCTION	Function the relationship between users and StarEyes fulfils
PERSONALIZATION	• Exercises based on preferences, skills and taste of user
TRUST	• Referred to and suggested by teachers and music schools
BRAND	• Technology pioneering (first-mover), set "original" standard

In terms of the Business Model Evolution framework, the potential target customers for WildChords represent thus only one section of the possible target

audience for the product envisioned as StarEyes. Figure 50 shows that the customer building block is not fully developed at this stage, compared to the StarEyes business model vision.

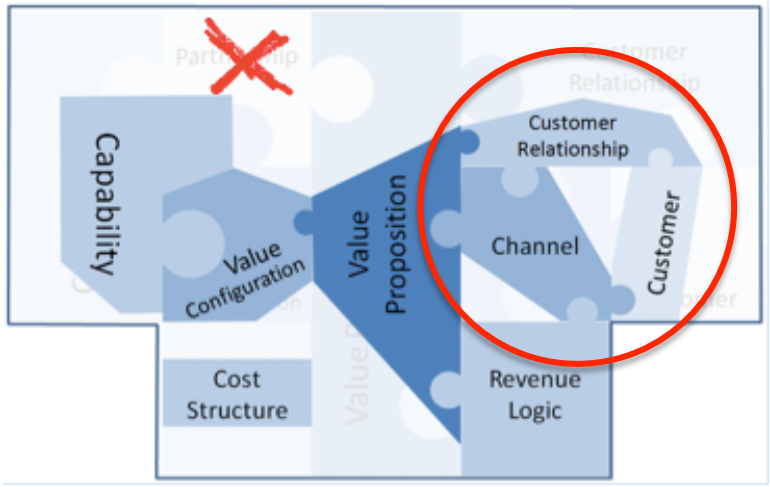

Figure 50. Business model framework visualization for the first stage, WildChords highlighting that the possible target audience for StarEyes is not yet fully addressed with this first product.

The customer relationship and the channel building block need to take both the value proposition and customer building block into account, and are thus also less developed at this stage.

5.3 Building the Value of WildChords

The Value Configuration of WildChords is rather straightforward. As one software product, it is streamlined to minimize interaction and customization as much as possible. In other words, it is a Value Chain optimized to serve the widest range of possible customers. While there are some game elements that make the product behave in different ways for different users, the product itself is the same for all users. A summary of the activities in the Value Chain can be found in Table 31.

Table 31. Summary of Value Chain for offering WildChords.

VALUE CHAIN	Activities
INBOUND LOGISTICS	• User login and data from activity within the game • Exercise choices and mastery (how long did exercise last) • Note inputs (audio signal for real time feedback) • Customer feedback (questions, problems, suggestions) • Potential customer leads (users they want to invite/ compete with) • Payments
OPERATIONS (all automated)	• Make WildChords available (evaluation of played notes) • Make progress status available (track development) • Make suitable exercises available (forecast development) • Enable competitions with other users
OUTBOUND LOGISTICS (online delivery)	• Make product available for download • real time feedback for played notes • learning material becomes available after each level • progress status records and displays the progress of user
MARKETING + SALES	• Enable user payments (automated) • Approach leads (automated, e.g. suggested by customers, teachers) • Collaborate with partners (personal: Teachers, stores, others) • General marketing activities (personal)
SERVICE	• Respond to feedback (personal, FAQ, Forum cultivation)

The capabilities of Ovelin are at this stage mainly in the Human Resources. However, for completeness the tangible and intangible resources are listed in Table 32. Most notably is the licensing agreement further discussed in the partnership network.

Table 32. Summary of tangible and intangible resources of Ovelin to offer WildChords.

TANGIBLE RESOURCES	Resources
Specific equipment	• Music instruments and equipment (tuners, amplifiers,...)
Basic equipment	• Basic office equipment, computers

INTANGIBLE RESOURCES	Resources
Licensing agreement	• Exclusive, worldwide, non-revocable license for polyphonic real-time audio signal recognition technology from Wavesum (for guitar education in game field)
Patent (s)	• Patent for StarEyes possible (Extensive patentability study conducted with IPR Partners, patent application ongoing)

The most important capabilities in Ovelin however come out of the workers and the daily performed activities to make WildChords a reality and available. The Human Resources are summarized in Table 33.

Table 33. Summary of Human Resourecs of Ovelin to offer WildChords.

HUMAN RESOURCES	Resources
Management	• Basic business management • Project coordination (with external partners) • Acquisition of private investments • Acquisition of public funding
Technology	• Game development • Signal processing technology • Implementation / productize • Ability of online sales and in-app sales • User account management, data analysis and mining
Music and education	• Guitar teaching • Exercise development • Background track production • Exercise progression development
Marketing	• Marketing strategy and marketing mix • Partnership for marketing strategy
Legal	• Technology licensing • Intellectual property rights protection (Patents) • Content licensing (using real songs in later products)

As a small start-up company, Ovelin planned from the very beginning to build a strong partnership network. In order to have get access to needed skills and technology, Ovelin made formal and informal agreements with different parties so it could concentrate on the key elements while the partners would perform the other tasks. A summary of the anticipated partnership network is shown in Table 34.

Table 34. Anticipated partnership network of Ovelin to offer WildChords.

PARTNER	Partnership agreement
Wavesum (license)	• Real time polyphonic audio signal processing technology (licensing agreement for technology library)
Audio research group of TUT (informal agreem.)	• Technology updates • project based optimizations
Mahtava (and/or other) (project based)	• Game engine implementation (logins, availability, statistics) • Game visualization (implementation of graphics/animations)
Intervisio (under negotiations)	• Market and marketing knowledge (different marketing channels) • Acquisition of song rights (for 2nd version of StarEyes)
IPR partners / Keksintösäätiö (Tuotenväulä program)	• Patentability study and patent application
Uusi Tehdas (accepted in Kehityskiihdyttämä Start-up program)	• Office space and equipment • Technology and business network • User testing
Accelerando	• Acquisition of private investments
Fondon	• Sales message development

The Cost Structure has been very roughly estimated with the available quotations and some estimates taken from other similar projects. The total cost to market a first version of WildChords was aimed to be below 40k€ due to the lack of available funding. While a first playable version was indeed achieved on this budget, bringing the game to the market eventually took significantly more money than was initially budgeted. The estimated usage of the funds can be found in Table 35.

Table 35. Estimated allocation of funds for developing and marketing the first version of WildChords.

ACCOUNT	Description and details	of total costs
Product development (external costs)	• Audio development (external costs) • Game development costs	40%
Product development (internal costs)	• Development of specifications • Project management	10%
Operating costs	• Salaries Ovelin team • Other operational costs	30%
Marketing costs	• Marketing campaigns	10%
Other costs	• Taxes • Overheads and buffer	10%

The value proposition building block is still very limited in WildChords as opposed to the StarEyes vision. As was discussed previously, this effects the customer relationship and the channels. However, it also significantly influences the value configuration, capability, partnership and cost structure of the venture.

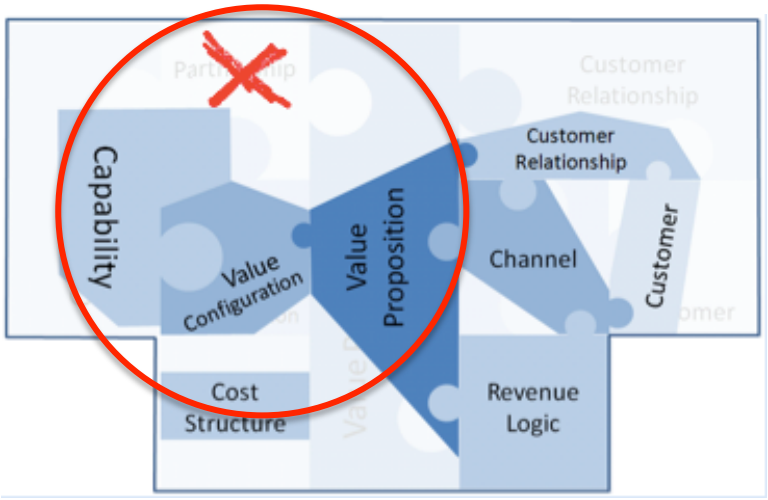

Figure 51. Business model framework visualization for the first stage, WildChords highlighting that the value proposition in this stage is not yet as extensive as envisioned for StarEyes, and also its influence on the adjacent building blocks.

5.4 Revenue Model of WildChords

Finally, the Revenue Model of WildChords was planned to capitalize trial ability of the product on the one hand, and the assumed willingness of people to spend a significant amount of money for music education on the other hand. The planned Revenue Model is summarized in Table 36.

Table 36. Planned Revenue Model for WildChords.

OFFERING	How WildChords connects and relates to it's customers
TRIAL	• Try first exercise for free (evaluation)
FREE USAGE	• Create account /login (Facebook login available) • Receive free exercise 1 week after previous one is complete • Compete with other players • Receive free exercise for recommendation that subscribes
PAY PER EXERCISE	• Receive additional exercise immediately 3€ (or multiples) • Available also as gift vouchers
PREMIUM SUBSCRIPTION	• Any exercise at any level available for 25€/month • Record of progress (see how you get better over time) • Guidance and learning path suggestions • Real songs at reduced price

The revenue model in WildChords is the only building block at this stage that can already be implemented in a way anticipated in StarEyes. Figure 52 shows a fully deployed revenue logic building block.

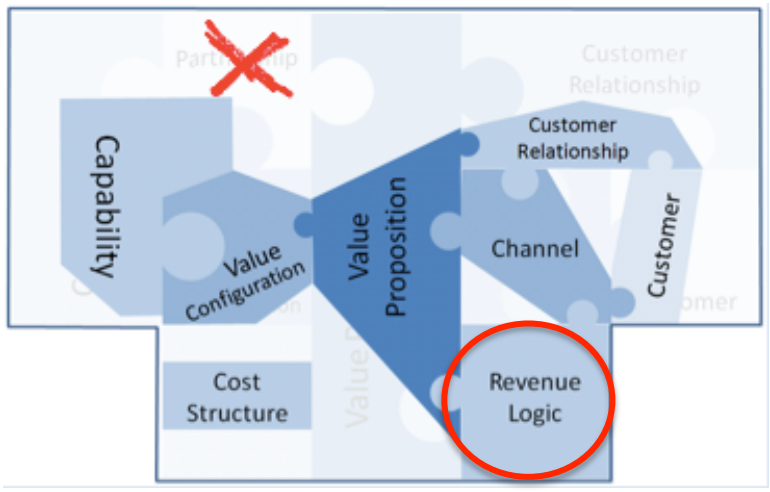

Figure 52. Business model framework visualization for the first stage, WildChords highlighting that the revenue logic building block is the only part that is already in a stage anticipated in StarEyes.

This concludes the theoretical part of the planning phase. The next chapter will describe what actually happened in the development of Ovelin in the first stage.

6 INITIAL BUSINESS MODEL AS VEHICLE FOR CAPITAL INVESTMENT

6.1 DEVELOPING WILDCHORDS

The first prototypes of WildChords were built for the Windows operating system. This allowed the team to do extensive user tests with many people, and several extensive sessions with a group of students at an elementary school. These initial results were extremely encouraging, as the students really liked to play the game and also the teachers were impressed with the results. After one test session, the students were asked to fill in a questionnaire, which was very encouraging. From the 40 school children (age 10-13), almost 90% awarded the game a "good" or "great" grade as Figure 53 shows.

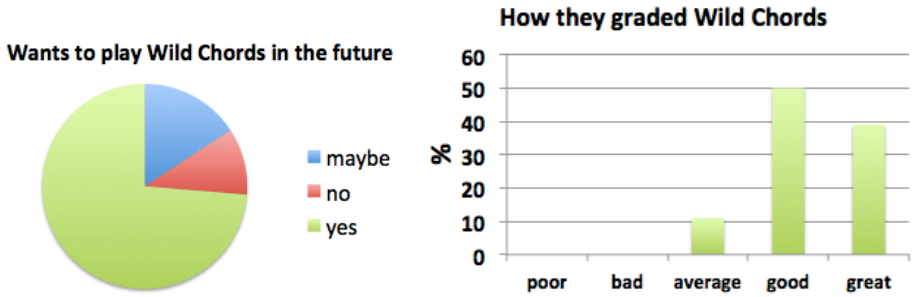

Figure 53. User rating of first playable demo game of WildChors (40 participants, 10-13 years old)

Additionally to the ad-hoc user tests, a second set of user tests was performed. The goal was to evaluate how the game would be used over a longer timespan, and at what rate the exercises would become more challenging. Therefore, Ovelin worked with two experienced guitar teachers (one of which was also part of the Ovelin team). He had two students come into the Ovelin office every week for several months to take "private lessons". However, instead of traditional classes, the students were assess based on their learning progress using WildChords. In other words, the focus of the classes was on helping the students using WildChords, and only to help then with additional inputs if the students were stuck. The results were even more encouraging than the ad-hoc tests. Not only did the students apparently enjoy playing the game. One of the teachers described his initial experience with the students as following:

> *"... I taught the kids for over 1 year, and they were quite hopeless and did not seem them have motivation to practice anything including the basic things (chords, scales, etc.). Yesterday I was surprised to see that they had actually improved quite a lot in just one week."*

And later the same teacher added:

> *"... the kids have practiced more at home in the last month, than in the whole previous year. And more importantly, now they are excited about it and really love to play their instruments."*

However, as the long-term tests also clearly showed, the functionality of WildChords was not sufficient to have the average user understand what he is supposed to do, let alone use it as a stand-alone learning experience. The Ovelin team identified 3 critical issues that needed to be addressed before the game could be released. First, both teachers strongly recommended including melody exercises (single-note exercises). In order to develop the motor skills needed, practicing chords alone is not sufficient. At that point, WildChords did not feature any melody exercises, nor was there game design and visuals to support for such a feature. The team decided to include an additional melody mode that uses standard tablature notation. In order to make the new mode fit the game theme, an animal subject was chosen as seen in Figure 54.

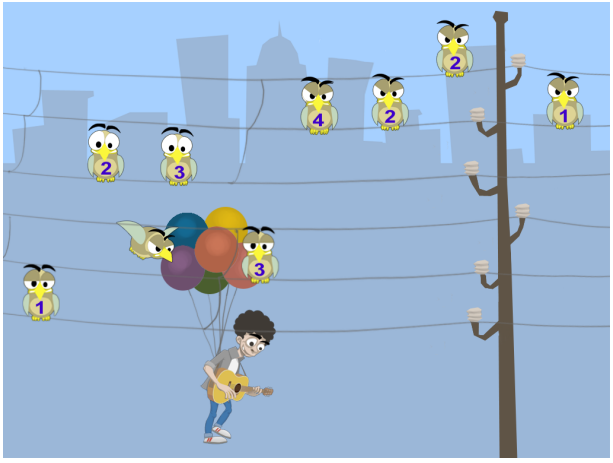

Figure 54. Melody mode mock-up for WildChords. Each wire representing a guitar string, while the number on each bird corresponds to the fret to be pressed on that string (Tablature notation).

The second crucial element missing was a tuner. As the audio technology analyzes the played notes with "absolute pitch" (as opposed to changes in pitch between notes), the game will not tolerate out of tune guitars. While this is a desired means to encourage users to keep their guitars in tune, it adds a surprisingly large amount of friction. While 3rd party tuner (or tuning app) was recommended to the users, the results showed that they did not tune their guitars at all during practicing. Thus, the team decided to build a user friendly, easy to understand tuner to be included in the game. After several attempts, a version featuring a "bleeding" function was found to work best with the testers. The tuner does not only show the current pitch, but also a "history" which helps users to understand how far away they are from the

optimal pitch, and how “fast” they are approaching it. Figure 55 shows the tuner with A string being tuned.

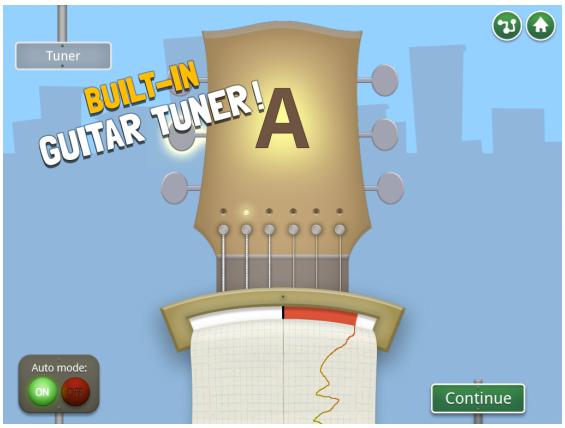

Figure 55. Guitar Tuner of WildChords.

Additionally to the guitar tuner, also a chord trainer was introduced, that lets users practice the chords for as long as they need, before entering the game. Using the polyphonic audio technology, the chord trainer is able to indicate for each individual string whether it was played right or not. In the example below, all but the 3rd string light up, which means, the 3rd string is either not played at all (bad positioning of fingers), or played a wrong note (wrong fret is pressed). The red string on the very left indicates that only 5 of the 6 strings have to be played for this chord.

Figure 56. Chord trainer of WildChords.

Third and most importantly, it turned out that the different microphone and speaker combinations found in different laptops caused some issues with the audio technology. Fine-tuning the technology to a "tolerance" level where it would work for all systems proved to be very difficult. From a technical side, there were two options to be taken: first, find a compromise parameter level that works for all systems fairly well. The alternative would have been to build a system that adapts parameters based on what equipment is used. This can be achieved either by manually tuning the parameters for each device individually. A more elegant though more extensive solution would have been to build a self-calibrating system. Such a system can takes latencies and other characteristics of microphone and speaker combinations into account automatically, without "knowing" what equipment is used.

Unfortunately neither of the options seemed feasible at that stage. The team was not willing to compromise on the performance, and financially any of the calibration options were not desired. Thus, the team decided to launch the first version of WildChords on one platform only. As Apple had just released their first iPad a few months earlier, the team decided to build WildChords "only" for the iPad at first. This meant the audio technology only had to be fine-tuned once for one device. Furthermore seemed the iPad a perfect device for WildChords. While still being a very niche product at that point, the first sales figures of the device were encouraging enough for Ovelin to bet on the platform.

Table 37. WildChords on iPad 1.

Other elements included into the game before the launch were many additional levels, a system for in-app purchases, a basic profile to track the progress of the user, the functionality for users to share / brag about achievements on Facebook, and may elements such as a small intro story, tutorials and developer credits. Furthermore a set of key metrics was introduced, in order to learn how people are using the app, and to identify possible problems. In other words, the game registers events that users encounter, and sends them to a centralized metrics platform. With enough users, the data from this platform can be used to understand and improve

the app usage. In the first release of WildChords, a total of 18 customized metrics was introduced. Which of them actually turned out to be important / relevant will be discussed in the next chapter.

1. When was the app download
2. What time does the user play the game
3. How long are the sessions
4. How many sessions are played per week
5. How many times a player needs to play an exercise to reach 1,2 and 3 stars (the stars refer to how well the exercise performed, from 0 = failed to 3 = perfect score)
6. How many % per exercise tries get 0,1,2 and 3 stars, individual for each exercise
7. How long playtime it takes to pass a package
8. How often do you play already completed exercises
9. Do you play linearly through the levels, or jump between different levels (this metric was not included due to the complexity of integration)
10. How often a user uses the guitar tuner
11. Which mode in tuner is used more often automatic vs. manual mode
12. How often a user look at the profile page
13. How often do you brag on Facebook
14. What are you bragging about (unlocked animals, new rank, new high-score)
15. Is the chord trainer being used (or do people skip it)
16. When do users buy packages (before or after completing a package)
17. How many packages do users already own
18. How many people never pass level 1
19. How many people skip the intro movie

As revenue model, WildChords was first introduced as a free app that featured 25 free levels, and additional levels to be sold as in-app purchases. For $1.99 per package, users would get around 5-9 new songs, which would take an average player around 1 week to complete.

While WildChords was implemented rather close to the planned first stage of the business model evolution process, some major changes have still been made. The most important changes occurred in the value proposition, which was increased by adding features such as the tuner and the single note exercises. However, also the channel was affected, as the iPad apps can be downloaded only from the Apple app store. Finally, the revenue model was at this stage replaced with a basic freemium model with additional song packages available as in-app purchases. Figure 57 visualizes these changes in the business model.

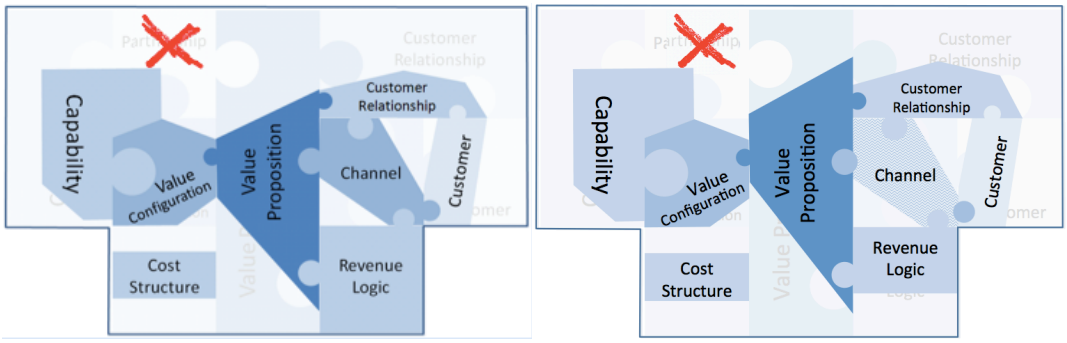

Figure 57. Comparing the planned (left) and executed (right) business model of WildChords, showing a different channel, slightly increased value proposition and the revenue logic only partly realized.

Thus, WildChords was built as a first stage towards the StarEyes vision. However, as the following discussion will show, the financing of WildChords development did not happen as planned.

From a financial side, bringing WildChords to launch has cost Ovelin approximately 150k€, including all salaries, side costs, equipment, multiple travels to US, the patent application and technology licensing fee. These expanses were covered partly with private investments of the founders and FFF (in this case family), partly with prize money from numerous competitions, and finally x% were covered by governmental support from Keksintösäätiö (patent application), and an R&D loan taken from the national funding agency TEKES (R&D costs).

As was introduced in the theory part, the Ovelin team planned to build and finance the venture over several iterative steps. The starting point would be a playable demo of a first simple game. When Ovelin was founded in December 2010, the financial resources were the 2'500€ required for registering the company in Finland. This initial capital was paid from the graduation gift money of the one, and a student loan of the other co-founder. However, not only the financial situation was not too encouraging at this point. Also in terms of developing the first product, the two co-founders had no relevant skills or experience to develop such a product. Furthermore, several attempts to find a technical co-founder had gone fruitless. Thus, so the prototype had to be built be someone else, and as the financial situation dictated, also cheap.

This is where the team decided to sponsor a Demola project. Demola is one of the "innovation engines" at Tampere based New Factory. The open innovation platform "New Factory" was established by the city of Tampere to foster entrepreneurship and innovation in the region. The Demola concept in particular seemed like an extremely promising way to develop the first product. It aims to bring together students, universities and companies, facilitated and physically hosted by the New Factory. The idea is that students get to work on real projects for companies, instead of projects made up at universities. The incentive for the

students is three-fold: first, the students get to work on an interesting real project. Second, the companies promise a financial incentive. While remuneration is usually modest (a few hundred euros), it often is agreed to be dependent on the performance. The more successful the project is, the more money the students would get. The third incentive for students however is what makes Demola unique. The students can actually get credit points from their respective universities. In other words, students work on relevant projects, get paid for it and earn study points.

Ovelin found a team of 5 motivated students and agreed to run a Demola project with them. The goal was to build the first playable demo version of the game. And the project turned out to be extremely successful. The first playable version of WildChords was available in March 2011. While still rather limited in functionality and content, it marked the moment where the Ovelin team realized that the key assumption turned out to be true. Combining game and guitar learning can be a lot of fun! The project ended successfully, and the Demola team was awarded with the maximum reward. Furthermore, two of the team members were hired directly out of the project and became the first employees of Ovelin. Meantime, the Ovelin management team was able to secure some additional funding. On the private side, friends and family invested 35k€ into Ovelin. The alumni club of the University where Christoph Thür got his bachelor degree (Interstate School of Applied Sciences, NTB) also awarded Ovelin a grant of approximately 12k€ through their Entrepreneur support fund. However, Ovelin was also able to secure funding from public sources. Digidemo granted a script and concept grant of 5k to support the development of the demo game. Finally, Ovelin was able to secure 23k€ loan from Keksintösäätiö, resources that were partly used for the development of the game, but mostly for the patent application.

All of the game design and development for the demo game were made together with the Demola team. However, the first version of the audio technology used in the demo game was built by our partner Wavesum. Initially Ovelin had a prototype of the technology built by Wavesum as a paid project, and later licensed it. However, because of the key role and strategic importance of this Technology, Ovelin eventually bought out from Wavesum. In the technology transfer agreement of January 2012 between our initial technology partner Wavesum and Ovelin, the parties agreed not to disclose the terms. Therefore, no details about this agreement will be found in this thesis. However, after 2012, Ovelin owns all audio signals processing technology relevant to developing the products envisioned by Ovelin.

Continuing the development, the Ovelin team grew to 5 people, two of which were hired straight from the Demola project. One additional member was recruited, who not only had experience in both signal processing and user experience, but was also an experienced guitar teacher. While we gathered additional funding from different sources, our aim was to raise an Angel round of a few hundred thousand Euros to cover the costs of bringing the game to market maturity. And should the launch be

successful, the team envisioned raising a VC round of 1-1.5M€ to scale up the business. However, as in most other areas of the "Business model Evolution" plan, things did not play out the way they were planned. Table 38 and Table 39 summarize the investments and loans taken by Ovelin until January 2012.

Table 38. Overview of investments in Ovelin (grants, private investments, prize money)

Date	Amount	Source and type
Nov-10	€2,500	Founders, initial capital to establish legal entity
Nov-10	€4,000	Digidemo, Grant for Script writing 1/2
Dec-10	€35,000	Family, private investment
Jan-11	€1,500	IIDA business idea competition, prize money
Mar-11	€12,000	CLUB NTB alumni, start-up grant
Mar-11	€1,000	Digidemo, Grant for Script writing 2/2
Jun-11	€20,000	Digidemo, Grant for demo game development
Oct-11	€7,500	Musex - Nordic Music startup competition, prize money
Nov-11	€10,000	Luova Tampere, Tampere city grant
Dec-11	€10,000	Slush 2011, Prize money
Jan - 12	**€103,500**	Total

Table 39. Overview of loans to Ovelin.

Date	Amount	Source and type
Mar-11	€2,000	Keksintösäätiö, Patentability study
May-11	€21,000	Keksintösäätiö, development and patent application
Jul-11	€63,000	TEKES, R&D loan 1 (pt. 1)
Sep-11	€17,000	Keksintösäätiö, development
Dec-11	€36,000	TEKES, R&D loan 1 (pt. 2)
Jan - 12	**€136,000**	Total

In terms of business development, fundraising for an angel investment (seed round), turned out to be the most frustrating part of the Ovelin development so far. Not only did all the efforts yield no investment, but worse, several meetings with possible investors turned out to be contra productive.

During the whole time from the first prototype (March 2011) to actual release in November 2011, both co-founders were rather heavily engaged in fundraising. These efforts focused with few exceptions entirely on Finland, and were performed partly with different support services that the city of Tampere paid for. Activities included cold-calling investors and angel groups, participating in investor events, and approaching individuals through references and introductions. The frustrating learning for the Ovelin management team after several months of engaged discussions was, that back in 2011 there was simply not really any "risk-investment" happening in Finland.

Repeatedly we were asked from so-called “angel investors” that we should approach them when we are creating revenue, and need money to scale up business. Which of course cannot be considered anymore “risk” investment. One reason for the repeated rejection was certainly that both co-founders were totally new to both entrepreneurship and the games industry. However, it also reflects on a problem experienced by many fellow entrepreneurs in Finland. Much of the money in Finland was made with traditional manufacturing, import-export businesses and of course with Nokia. However, the concept of “high-growth” start-ups that either works out extremely well, or will go bankrupt did not seem to resonate well with the investors the Ovelin team has met.

The worst part of this phase was, that the management team started to re-write its business plan based on which answers seemed to satisfy the investors. In other words, the honest uncertainties about certain aspects of the business were replaced with a concrete answer that was made up initially. As an example, the initial revenue model was though to be a freemium model, limiting the number of songs that could be played. By paying a monthly premium subscription fee, users would no longer have this limitation and can play as much as they wanted to. However, the idea of monthly premium subscription was met with much concern. At the time, games like Angry Birds were making good profit with in-app purchases, and it seemed an interesting approach for us too. Thus, we started presenting the in-app purchase model to investors instead, and indeed the reactions were more positive. Neither model had been tested, so it would have been difficult to give a good answer to which model would perform better. The danger in this is that over time, the team starts to favor a certain approach because of how people perceive it, rather than because of how it actually works. In other words, directions might be chosen based on the opinion of people that do not have any more information or experience in the field than the Ovelin team had. Learning from different people is of course very important and happens in most conversation, be it with a random person on the street or with an investor. However, because of the “investor” status, the opinion of an investor is often valued very high. If the investor does not have any relevant experience, or worse, experience that is no longer valid because of changing market conditions or new technology, this “expert opinion” can be harmful to the start-up.

Because of many frustrating experiences, the team eventually decided to cease all discussions with Finnish investors and concentrate on launching the product. At the same time, Ovelin participated in the Startup Sauna, a start-up accelerator program based in Helsinki. Unlike any other service, the Startup Sauna emerged as a grass-root movement of students at the Aalto University in Helsinki. The goal of the program (which started in 2010 as Aalto Venture Garage Bootcamp) is to promote entrepreneurship in Finland. While supported by the University, most of the work at Startup Sauna is performed on a voluntary basis. Most impressive is the extensive group of Startup Sauna Mentors, which consists of many successful entrepreneurs that share their experiences and feedback with the start-ups.

Furthermore, during the Startup Sauna program, some of the teams got to spend 1 week in the Silicon Valley, meeting entrepreneurs, investors, media people and bloggers. The goal of this trip was mostly to expose the teams to the vibrant start-up scene in San Francisco, and to learn from "the best".

For the Ovelin management team, there were at least three major take-away's from the Startup Sauna program. First, we should focus more on developing the product (through user testing, rather than spending most time in trying to convince investors of our business). Second, a thorough plan of the next 5 years is not needed. In fact, an advice we have gotten several times is: have a 5-year vision, and a 6 months plan. Everything else is guessing. And the third take-away from the Startup Sauna program was to focus more on the UK and US market in terms of fundraising.

Eventually, the Ovelin team concluded the development of the first release candidate of WildChords, and planned to officially launch the game in November 2011 at the Slush conference in Helsinki. At this point, approximately 200k€ had been invested into the project, and the financial means of the Ovelin team approached pretty much zero. In fact, during this intensive time, several of the employees were asked to reduce their work hours (or at least their paid work hours).

Figure 58 visualizes how the Ovelin management team was unable to raise a seed round, and instead financed the development of WildChords with different means.

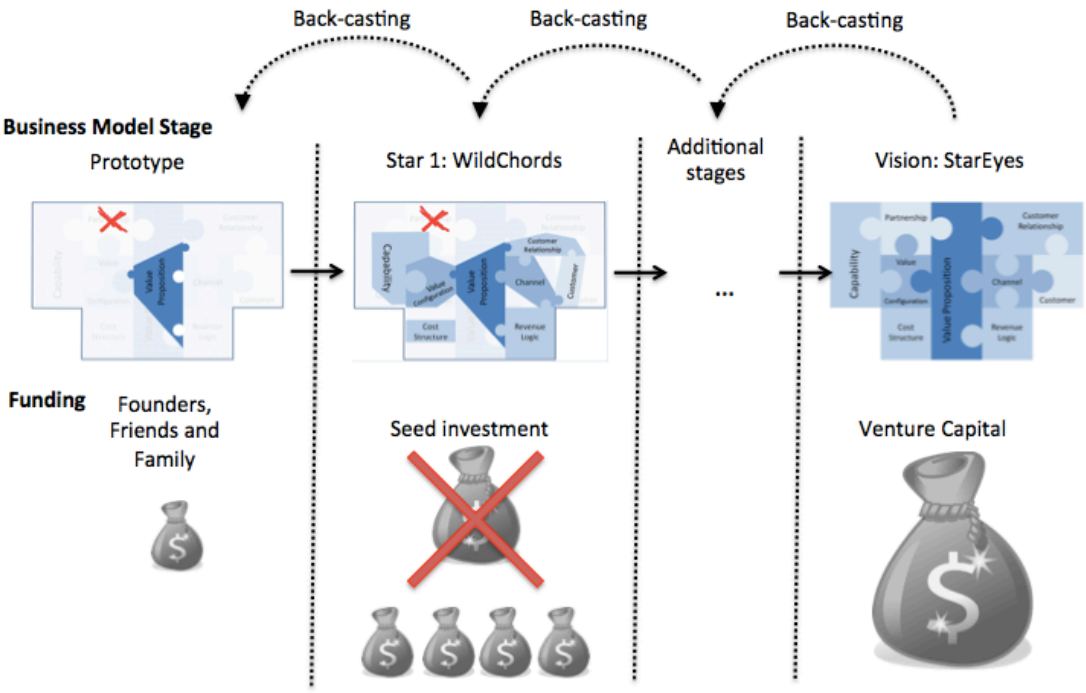

Figure 58. Visualization of attracted funding. Rather than being able to raise a seed investment, WildChords was financed with a range of different resources from prize money to public support sources.

WildChords was financed with several minor investments, rather than with the anticipated seed investment from an angel investor. However, as the launch of the product was rather successful, the Ovelin team was able to attract much larger funding than was initially planned for the second stage.

6.2 Release of WildChords

Leading up to the launch of WildChords 1.0 for iPad in November 2011, the Ovelin team was able to create some hype around the product already. Initially the game was launched only in New Zealand and Canada to test that all functions and the in-app purchases system work. After two weeks without having discovered any major difficulties, the game was to be launched globally on November 13th 2011 at the Slush Start-up conference in Helsinki. Ovelin was one of the finalists of Slush 100, a start-up competition during this conference where the 100 most promising start-ups compete for a grand prize of 10k€, and the chance to present their company on the main stage. Ovelin not only made it to the top 5 companies that were able to present on the main stage, but eventually won the entire competition. Because of the rather exciting "show", much of the media and investor scene present that day started paying closer attention.

Figure 59. Photo of launch presentation of WildChords at Slush 2011.

Before the launch, Ovelin had hired a PR firm to help out with the promotion of WildChords in the US. Furthermore, a simple game trailer had been produced and uploaded to YouTube (see Figure 60). Finally, a good connection to several tech bloggers had been established, which agreed to write an article about WildChords on the day of release.

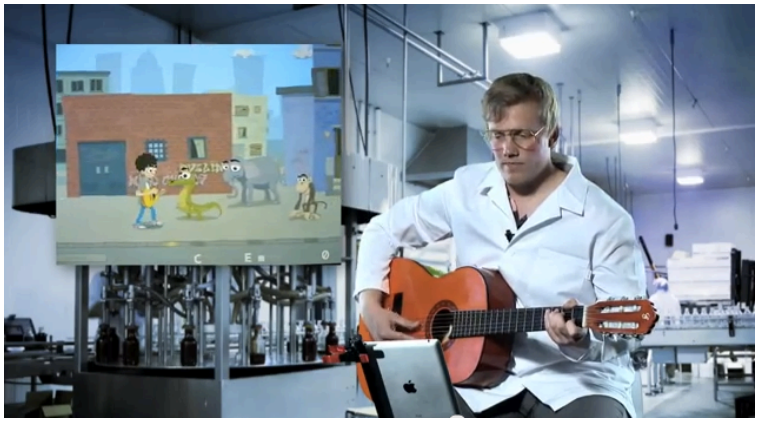

Figure 60. Scene of the WildChors launch trailer.

As a result, WildChords reached the #1 of the download charts on its very first day of release, knocking down the then popular mobile game Angry Birds to 2nd position for almost two weeks. The user reception of the game has mostly been very positive, and the app enjoys a favorable 4 star rating in the App store as Figure 61 shows.

Figure 61. Star ratings of WildChords in the Apple app store.

Because of the successful launch, Ovelin was approached by representatives of the Apple App store that was interested in featuring the game in the App store. Being featured is one of the most powerful ways for an app to be discovered in the app store. And indeed, because of the featuring, WildChords was downloaded over 100k times in the first month alone. And the game became the #1 music app in 34 countries. While being featured in the App store was definitively the largest driver of downloads, it also had several short, and some long-term drawbacks as will be discussed in the next chapter.

As WildChords represents a different way of interacting with a mobile device (solely through the sound of a guitar), it received also much interest from the media. Articles and reviews of WildChords appeared on gaming sites such as TouchArcade, Gamasutra or Gamespot, Tech blogs like TechCrunch and TheNextWeb, but also in the mainstream media including The New York Times, The Guardian and WIRED. Finally, WildChords also won an ample amount of international awards and prizes, including the following:

- The Sunday Times "Worlds Best Apps List 2012"
- Best European Learning Game (Ludus, an EU program for learning games)
- iPad Game of the Year 2012 (TILT TV)
- Winner of SXSW accelerator 2012 (Music)
- Winner of MIDEM labs competition 2012
- Most innovative game of 2012 nominee (IMG Awards)
- 2012 Flurry Spotlight Finalist
- Winner of Tech City UK 2012 (startup competition)
- Winner of Slush 2012 FI (startup competition)
- Nordic Game Awards 2012 nominee
- App of the month (musicians with apps)
- WSA awards for m-learning (an event from the UN)

All in all, the launch of WildChords can be seen from Ovelin as rather successful. The download numbers were extremely satisfying, while the reception by users, media and juries was extremely positive. However, in terms of revenue, WildChords did not perform that well as will be discussed later on. Furthermore, because of the hyped launch and the Apple featuring, the team had difficulties figuring out which activities to focus on in order to improve the game. In other words, the team had a lot to learn from the launch, and the usage of WildChords.

In terms of finding an investor however, the launch of WildChords turned out to be extremely beneficial. After the launch, several investors in the UK and US approached Ovelin regarding a seed round. Thus, the Ovelin management team spent the last months of 2011, and the beginning of 2012 in London and San Francisco, in order to close an investment round. After many meetings, discussions and presentation, Ovelin decided to take a 1.4M$ investment from Silicon Valley based True Ventures.

Three main reasons lead to this decision. First, True Ventures has a broad portfolio of very interesting companies, including education, games and mobile services. In order to strengthen the position of all True Ventures portfolio companies, the firm has established an extremely strong founders network to help each other out with contacts, feedback and sharing experience. Already during the Due Diligence, were the Ovelin founders connected to several other True Ventures portfolio company founders, which all confirmed this strong community. As a start-up from Finland, these local ties to the US seemed extremely valuable. A second reason why we chose to raise a round with True Ventures was, that all the discussions with the partners seemed extremely straight- forward and showed the entrepreneur friendly approach True Ventures promotes its approach with. And the third major reason to go with True Ventures was that they were willing to invest into a Finnish company. In other words, we did not have to establish a US company, nor did any of the founders have to commit to move to the US full time. The advantage of this is that Ovelin can continue utilizing the resources from public sources such as TEKES for R&D, and later for the internationalization, and that the founders could be based in Finland during the crucial phase of building up the team.

The time from the first contact with a partner of True Ventures in November 2011 to the actual investment in February 2012 was an intensive but exciting period for Ovelin. The company moved its headquarters to Helsinki, and started hiring more people. Furthermore, it was time to re-evaluate thoroughly the game, its performance, and all the assumptions made in the product and in the business model.

While the extensive planning of Ovelin in the very beginning of the company was extremely helpful in many ways, it also turned out to be a lot of work. And while writing a business plan and thinking about a business model is highly beneficial, it also had several negative, even dangerous effects. However, as it had been done so thoroughly in the Ovelin case, because of this thesis, it was a good opportunity to take the assumptions up again after closing the seed round, and re-evaluate the business model. Following all 9 elements of the Business Model Canvas are re-visited, and discussed based on the current knowledge of the Ovelin team.

One of the key differences from earlier versions is the focus we try to bring into every element. For example, the Value proposition of course still contains things like “reduction of effort for not having to drive to guitar classes”, or “reduction of

risk due to cheap and easy adoption". However, many times a larger amount of reasons can actually be counterproductive, as it might take away the focus of what is really important. In the case of Value proposition, the by far most important one is that our service is a guitar practice you'll actually do, because its fun. Similarly other elements of the Business Model Canvas have been focused down to one or a few key points, rather than listing all of them. Table 40 summarizes the reformulated and re-thought Business Model Canvas with the learning taken from the WildChords product.

Table 40. Business model evaluation after the launch.

Business Model building block	**Description**
Value Proposition	**Reasoning**: the guitar practice you'll actually do, because its fun. **Value Level**: Innovation (it's a game that's fun to play) **Price Level**: Free, economic **Life Cycle**: Its easy to adopt, and personalized to users life cycle
Target Customer	**Criterion**: Interest in guitar learning
Distribution Channel	**Channel**: Online
Customer Relationship	**Customer equity**: Acquisition, retention **Function**: Personalization, user to user experience
Value Configuration (Value Chain)	**Inbound logistics**: User data, Exercises, audio inputs, user feedback, user leads, payments. **Operations**: availability, progress visibility, exercise development, competitions **Outbound logistics:** Product availability, real time feedback, learning material availability, progress visibility **Marketing + Sales:** Generating traffic through internet touch-points **Service:** Respond to feedback
Capability	**Tangible:** basic and specific equipment (musical equipment) **Intangible:** Audio signal processing technology **Human:** Management, Technology, Music and Education, Marketing, Legal
Partnership Network	**Planned partnerships:** User acquisition partnerships
Cost Structure	**Operations:** Salaries, other costs: 70% **Marketing:** campaigns: 20% **Other costs**: Taxes, overheads, buffer: 10%
Revenue Model	**Revenue Streams:** Trial, free usage, monthly premium

As was mentioned before, the value proposition was focused down to what has been discovered to be the main reason for people to be excited about WildChords. If asked what is the one key reason why people would use WildChords, the answer is rather consistent. Many people have made the experience of getting frustrated in the early phase of instrument learning. Other reasons such as money, time or

convenience might play a role, but for most its clear that a lack motivation to practice is the key reason for them to stop practicing. Thus, this is clearly used as the key Value Proposition. This also translates into the Value Level, Price Level and Life Cycle. What sets Ovelin's products aside is the innovation around audio technology and the gamin layer on top of it. In terms of Price Level, the free and premium price are special, though as we shall see in the Revenue Logic, was adapted from the in-app purchase model. Finally, the Life cycle of the product, it is especially the ease of adoption (anyone can start playing) that sets Ovelin products apart.

One of the things that have taken many resources and time writing the business plan was the target customer. On the one hand the analysis in terms of qualitative description, what criteria describe the user, and also in terms of quantities, how big is the market. We did a typical market analysis and went through countless statistics in order to come up with numbers and descriptions of users. In the end we had the numbers as presented earlier, and somewhat an idea of who these potential customers are, what age groups, what instruments, what skill level, gender, and all for different countries. Based on these numbers, we decided to make a beginner guitar-learning game targeted to a young audience, and WildChords was the result. However, we soon discovered that our user group did not fit very well the target audience we made it for. First, we had way more older users, age 35 and above, and second, many of them were actually not complete beginners, but new some basic chords and the general manipulation of the guitar already. Furthermore, it seemed that while some kids really liked the animal theme, a large portion found it already too childish. On the other hand, our older audience seemed rather positive about the theme, as it took away the seriousness and intimidating feel of learning an instrument. Thus, we decided that the denominating factor of our most potential target users is actually not very confined to traditional demographics. What they have in common is that they are mostly self-learners, and use online services, foremost YouTube videos to learn to play the guitar. Thus, we decided for the next product to aim for a more demographic-indifferent approach that is still playful and gamy, yet not targeted so directly. We took inspiration from games such as Angry Birds or Cut the Rope, which seem to appeal to a very broad audience. Thus, the by far most relevant criterion is "guitar beginner and intermediates", and especially those using online services to learn to play the guitar by themselves.

In terms of Distribution Channel and Customer Relationship, we also realized quickly that using the app store for both discovery and distribution is not very suitable. While being featured by apple, and on top of the charts, indeed users discover our game through the app store. However, with a rather specific app, that requires users to have a guitar, it is not very likely to stay on top of the charts. The top positions in the Music category tend to be filled with apps that almost everyone can use, such as Pandora, Spotify or Shazam and Soundcloud. Thus, relying on the App store as a discovery channel was definitively not going to work as only approach to market WildChords. Still, as a distribution channel, the app store is one

good channel, especially in the early phase, as it does not require the developer to build up its own payment system. However, most people are still using the internet to search online for ways to learn to play the guitar. In order to reach this potential audience, our next game would have to be found through more traditional online searches. Thus, we decided to have a broader set of distribution channels, and make the game available on different platforms, including browser based.

The second key learning of Customer Relationship was in terms of the initial skill level. WildChords assumed no previous skills of the player, and started at an extremely easy level, and also the pace of difficulty increase was rather low. For users with some existing guitar skills, this meant playing through very easy (and thus boring) levels, before reaching a level they would find appropriate. To avoid this, each package in WildChords can be accessed directly. In other words, the users can chose where in the game to start. However, this of course takes away some of the excitement and fun, as the users can simply skip ahead if they feel like it. And worse, many users may skip ahead, without having the needed skills yet. Thus, getting frustrated because the levels are already too difficult. This fact was amplified by the games childish look that gave users the impression it would be very easy to play. However, WildChords did feature songs that were actually already pretty advanced due to fast chord changes between rather difficult to play chords. Taking all this into account, the team decided to introduce a “skill test” level into the next product, that would allow complete beginners to start from scratch, while giving intermediate players the chance to unlock the easy levels up to a level where their skills were.

The Value Configuration stayed rather similar, with one major change. Relying on Apple featuring and media coverage alone is not a very sustainable approach. As the featuring was turned on and off, and eventually shut off for good, it can help to drive traffic and awareness, but this does not last. Media articles on the other hand also generate a peak, but also they are not very robust. And as it turned out, the user-to-user sharing of achievements in WildChords was extremely poor. In other words, the download numbers of WildChords was characterized by extreme ups and downs. This is what happens to many games, as they need to “break” through, or they will be eventually discarded. However, with guitar learning it is different. People are having touch-points on a daily basis about guitar. As an example, not many people looked up how to shoot angry birds with a slingshot onto evil pigs. Thus, the game had to be pushed into the market, in the case of Angry Birds extremely successfully. However, guitar learning on the other hand does generate relevant searches and touch-points in the internet on an extremely stable rate. These searches can be used to market a game like WildChords. Thus, the marketing efforts of Ovelin focused forthcoming much on identifying these touch points (YouTube videos, forums, Tablature sites, etc.). With this in mind, one key part of the Value Configuration became online marketing, in order to drive relevant traffic to the game.

This was then obviously also one of the Capabilities that had to be added to the Ovelin team. However, in terms of Capabilities, one even more major shift has occurred. Looking at competing products, it soon became clear that at the current state of development, the products are as good and as much fun as the audio signal processing technology is reliable. Nothing more frustrating than getting points for free, or worse, not getting points even though the chord or note was played correctly. In other words, the audio technology in the game had to be further developed dramatically, and also to be maintained as the major core competence within Ovelin. Thus, Ovelin decided to buy out the technology from its partner organization. Furthermore, the Ovelin team was able to attract one of the worlds leading audio signal processing experts to join the team as late co-founder and CTO.

The Partnership building block is one of those that has changed dramatically since the first version of the Business Model Canvas. While Ovelin was always open to working with competent partners, it turned out that many of the planned partnerships did not perform at a level we found acceptable. This included external development, help in marketing, fundraising and several other areas. And, because Partnerships are usually rather work intensive, Ovelin cut down all partnerships to just a minimum. With regard to music right holders, Ovelin actively tried several approaches, but was thus far unable to reach an agreement with a party to license songs to the game. Thus, only things such as legal services, accounting and occasional specific help with marketing are still maintained. The only area where Ovelin is currently actively looking and working with partners is in terms of user acquisition.

This change from “partner-focused” to in-house development obviously has a very strong impact on the cost structure, where now some 70% of the expenses fall into the operation of Ovelin, mostly for salaries of the developers and marketers. However, also a rather large share is now allocated to marketing and driving traffic.

Last, the Revenue Model was as mentioned earlier one of those areas that the Ovelin team had to look into more thoroughly. While the in-app purchase model seemed a good solution when the game was launched, it proofed not to monetize very well. On the one hand, people who download the free game might strongly under-value it. Like many other free games, users might spend a few minutes to try it out, and if they don’t get hooked immediately, the discard it again. Better players on the other hand, thought it would only be suitable for beginners, and thus never tried out the harder levels that might have been suitable for them. Thus, the pricing of WildChords was changed to a fixed up-front price, however including all in-app purchases already. While the download numbers obviously decreased dramatically after this step, the actual monetization went up. Furthermore, because people generally read through the description before buying an app (versus just downloading a free app and try to figure out what it is), also the ratings for WildChords went up significantly.

Still, the danger of having a product with a 1-time price is that you can only monetize a user once. Furthermore, this creates an incentive to the developer to focus on how well a product sounds and sells, rather than creating an experience which users will come back to for a long period of time. Since Ovelin's goal is not "just to sell game", but rather to develop a better learning tool that actually teaches people in the long run to play the guitar, monthly premium subscription as another Revenue Model has been looked into for a future product. This will allow the team to monetize dedicated players better, create a lasting relationship, and to focus also on the long-term usage. After several interviews, it also seemed that people would be open to pay on a monthly basis for a music education service, as this is a model used in traditional music education.

Taking all these minor and some major learning into account, the Ovelin team decided after closing the investment round in February 2012 to develop an entirely new game, rather than to re-do or update WildChords. GuitarBots, the second guitar learning game developed by Ovelin thus incorporates the best practices from WildChords with all the inputs and lessons learned along the way.

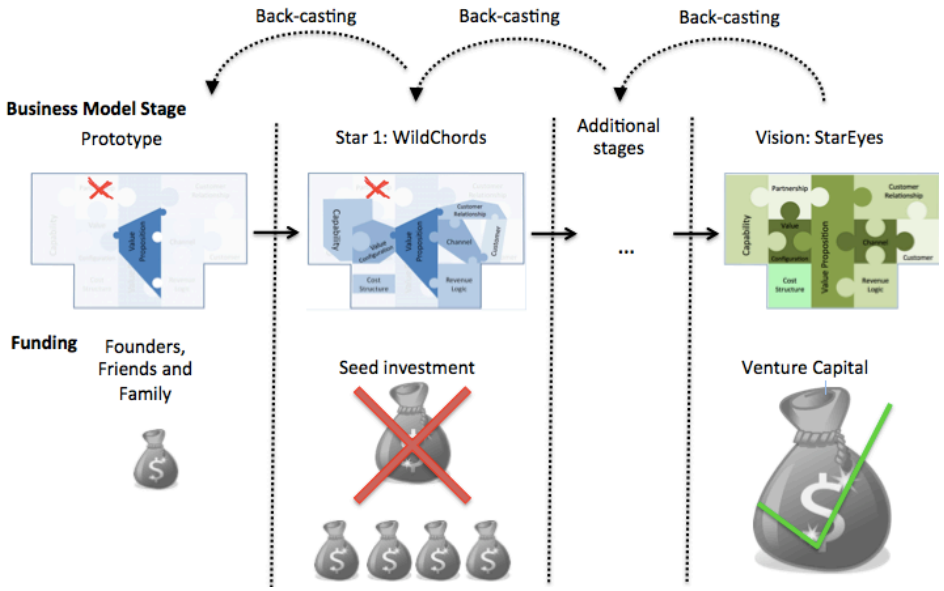

Figure 62. Visualization of attracted funding. After the launch of WildChords, Ovelin was able to attract venture capital from Silicon Valley to finance the development of the next stage of the venture.

Figure 62 finally visualizes how venture capital was attracted after the launch of WildChords to build the envisioned product. However, also as became clear in the previous discussion, much of the StarEyes business model was being altered due to the learned lessons. Thus, the envisioned business model for StarEyes has been altered too.

6.3 Back-Casting Business Model Evolution

The idea of building a product such as the one envisioned in 2010 with the name StarEyes is a huge project. Thus, it makes sense to approach it in pieces and build it in several stages instead of attempting to build it in one major development effort. This is advisable even if the financial resources would be available, and was in this case the only option as there simply was no capital available to the Ovelin founders when starting out. However, planning these stages through as attempted by the team at first, and as it was proposed in this "Business Model Evolution" thesis did not proof to be an effective way. Instead, Ovelin eventually adopted more of a Minimal Viable Product approach, in which the goal is to test key hypotheses of the venture rather fast. Getting an actual simple product in front of users, and starting to learn and understand from user tests is an extremely helpful tool to confirm assumptions, but also to find out where the "plan" does not hold up.

Formulating an extensive plan with different stages may work out, however in this case much of what was assumed for the first and second stage did already fall short. One of the common mantras of many entrepreneurs the Ovelin team has talked to was to adopt an approach where the team formulates a 5-year vision, and a 6 month plan. In other words, it is crucial to know what the company wants to do in the long run, and it is critical for the development to plan the next steps more accurately. However, a detailed planning of a 5-year development is very unlikely to work out, while it has some serious drawbacks as explained earlier.

First, having a thorough plan takes a lot of time, and a lot of guesswork. If one or several key assumptions turn out to be wrong, the team is basically forced to throw away much of the subsequent planning that builds on it. Furthermore, having steps planned out might provide a sense of certainty, whereas a mindset of trying out and failing fast might save a start-up a lot of time and effort. Second, there is a risk of starting to believe in the own plan without any proof, simply because investors and advisers seem to react positively and consider it realistic. And last, writing out a plan in full text is a rather inefficient way of formulating it, and it is also not a very effective way to communicate internally and to investors. A full text version allows the management to write down all possible and plausible features, rather than crystalizing the key points it should be focusing on. The Ovelin team has soon switched to a 10 pages PowerPoint presentation, each addressing very briefly every element of the business plan. This forced the team to focus on what is really important, and has the benefit that even major updates can be formulated in a short amount of time by replacing a slide.

Thus, while the writing process of the business plan, and the first part of this Thesis were extremely beneficial in many ways, it did not in the end reflect much of how the development of Ovelin really worked. The financing over several steps turned out to follow even less the outlined plan of 2010 so far.

6.4 Business Model Evolution as tool for VC

As it was introduced in the theory part, it is common for high-growth start-ups to raise several rounds of financing to support its current stage. However, in the case of Ovelin, the plan already failed at the first stage. Because of several reasons, Ovelin was unable to raise an angel round in the early phase to get the first product developed. Because of good fortune, an efficient way of developing the product, and due to the support of public sources the team was able to release the first product without any major 3rd party investment. Eventually Ovelin received a significant investment after the release of its first product, and is currently planning of following the pattern of raising additional money when needed to scale to the next level.

However, since Ovelin was not able to close the first planned round, the development had to take this into account. Most of the WildChords development was chosen to make it as cheap and fast as possible. In retrospective the shortage of funding might have actually helped the team to focus on developing only a "MVP" rather than adding additional features that were planned, but would turn out to be not as relevant or urgent as initially thought.

Enabling start-ups to move up the steady slope of mount improbable is the main advantage and obviously the reason why the Business Model Evolution approach has been worked out. However, this approach can have other advantages, but also disadvantages as summarized in Table 17.

Table 41. Advantages and disadvantages of the Business Model Evolution approach.

Advantages	**Disadvantages**
- Enabling partial product development with insufficient funds to finance whole project	- Increased planning and analysis efforts and project costs
- Incorporation of new knowledge and user experience in early development phase	- Risk of early cancellation of project due to negative user feedback
- Shorter go to market time due to smaller initial project (first customer acquisition)	- One way decision that may be difficult to be made undone
- Increased bargaining power over partner organizations	- Risk of waking competition in an early phase
- Reduced initial financial risks, due to distribution over several phases based upon the previous successful implementation.	

The main advantage of the Business Model Evolution approach is that the product development or another part of the business model can be developed with yet insufficient financial or other resources. However, such an approach may also be used to incorporate new knowledge and experience already in the early phase of the product. This may reduce myopia of the development team and help to orientate the

product with a correct choice of features to fit as good as possible to the market requirements. Furthermore, it can reduce costly loops and the risk of developing features that add little value to the product. Because the time to develop the first product may be significantly reduced compared with the time needed for the final product, the go-to market time may be reduced too, which enables the organization to capture part of the market already in the early phase. If for example a partnership with a much larger organization is anticipated, the bargaining power of the start-up may be increased much, if it can already demonstrate that the partnership would be beneficial, though is not a make-or-break connection. Finally, the financial risks may be reduced, because the project is divided into several stages that build upon each other. At some early stage of the Business Model Evolution, the assumptions may be proven wrong, and the business may not be implemented the way the start-up intended to. Then, an alternative approach may be searched for, or the project has to be halted. It is financially very beneficial to “check” the market acceptance of a product after every stage, before investing much more time and money into the project.

On the other hand, the advantage of being able to pull the plug at every stage holds the risk of closing down the project prematurely. It may be, that the intermediate steps of the product result in negative customer feedback, and the project is halted even though the anticipated product could have been a success. In other words, the product did not qualify for the "no irreducible complexity", since only with all parts in place, the product can be functional. Other disadvantages are the increased planning and efforts as for example this thesis demonstrates, and also project costs. Each sub-product needs to be tailored to its specific target market, finalized and finished in such a way that it can be sold to customers. While this may improve the start-ups experience in productizing and marketing products, it certainly comes at much higher project costs and effort. The short time to market is also a two edged sword, since it may wake competition in a very early phase, and since the competition is often a financially much more potent company, it might release the anticipated product before the start-up has done so.

A final remark should be given about the reversibility of certain steps. Similarly to the metaphor of mount improbable in biology, there might be certain steps that cannot be undone at all, or only by evoking significant costs. For example, the product of the first stage would optimally be given away for free. However, if the subsequent versions would be for sale, users might be very reluctant to pay for a service they have known to be free.

7 CONCLUSIONS

Starting an own company requires a lot of work and a great deal of perseverance, but also good planning. This Thesis discusses the planned development of Ovelin in 2010 when the company was just established and compares it to a state 18 months later to how the company and its first product WildChords actually developed. The plan of the Ovelin team was to develop an extensive music-learning platform over 6 development cycles instead of one major project. This approach was chosen to take into account the lack of funding at the early stage.

Breaking down the development into smaller sub-development projects turned out to be a suitable way to achieve a first product launch at the fraction of the cost the envisioned product was budgeted at originally. Thus, the Ovelin team was able to build a product and launch it without any significant investment form private investors, and rely on investments from friends and family, and public sources.

The Business Model Evolution approach is an interesting concept that might indeed be a possible way of planning the development of a start-up. However, the approach that was taken does not account enough one of the most important aspects of entrepreneurship: continuous learning. The first stage of the development, a simple, fully functional self-learning game called WildChords included many aspects that were initially planned. However, as the team learned from users and from marketing the first product, it turned out that also many of the assumptions made in 2010 proved to be wrong our outdate. Thus, all the subsequent stages of the development are based partly on wrong knowledge. This to such an extent, that the initial plan would not make sense anymore to be implemented.

In the actual development of Ovelin, a good part of the initial plan outlined in 2010 was actually implemented the way they were planned. However, during this period the team learned much about its user, and the usage of its product that following the plan would not have been advisable. Instead, the team re-evaluated the Business Model Canvas and formulated the next step again, taking the new knowledge into account. Some of the main adaptations of the original plan are outlined here. First, the focus Value Proposition that was rather elaborately described in the first plan was narrowed down to one key point: Our product is the guitar practice you'll actually do. While many of the other points noted initially still are valuable, this is the main reason why our service is different than the others. Thus, this was moved in focus for business development, as well as the marketing message to the actual development focus, and is also reflected in the revenue model. Second, the rather systematic breakdown of the possible target users was reduced to pretty much one common denominator: they are beginners or intermediates that are using online services such as YouTube to learn to play the guitar. While other criteria such as age still do play a role, the Ovelin team found them to be less important than

initially assumed. Third, the Apple app store seems to be a very suitable distribution channel, however not in terms of user acquisition. A game like WildChords cannot sustain a high rank in the download charts, due to its limited audience compared to other apps. Fortunately, potential users of a guitar learning game do have rather clear touch-points online. Thus, the Customer Relationship block was adapted and has now one of the main focus points on user acquisition through other online channels guitar learners might be visiting. Furthermore, in order to ensure a better user experience for non-beginners, the integration of a skill-test to the game was decided. Thus, giving most users a rather personalized experience as the skill level of the difficulty level of the game meets the player skill level rather fast.

In terms of Value Configuration, one major update has occurred. The marketing efforts were strengthened to include online marketing to generate relevant traffic to the Ovelin products. This means that the marketing budget has been increased, and the Capability building block thus included a strengthened online marketing team. The other major update in Capabilities happened as the audio technology was found to be the key enabler of a successful development of Ovelin. Thus, the team decided to buy the technology and hired one of the worlds leading audio technology experts as late co-founder and CTO. In terms of Partnership Network, Ovelin has rather drastically changed its approach. While some basic services such as legal and accounting are still performed by a 3rd party, the team found it to be more efficient to do most of the development in-house. Unfortunately, to date the Ovelin team was not able to form a partnership with a record label or any organization that holds the legal rights to popular songs.

The cost structure has changed dramatically, since very few 3rd party services are being used. Thus, most of the costs in Ovelin are in the operation, specifically the salaries of the development and marketing team. A larger portion has also been allocated to the marketing budget. Lastly, the Revenue Model has been altered to take into account the disadvantages experienced with an in-app purchase or up-front price model. The Ovelin team is currently planning to use a monthly premium subscription model that would allow the company to monetize users over the long term, while aligning the Revenue Model with the overall company goal of providing a service users would use over months and eventually years.

The initial plan to develop the music education service was set out to happen over 6 steps. However, as the discussion above shows, already after the first step many of the assumptions were updated. Thus, the remaining 5 steps that were planned obviously depend strongly on the first phase and are thus also subject to this changes. While still holding up the vision of an extensive self-learning platform, the team decided to take a different approach to plan its development. On the one and, there is a rather thorough 6 month plan which gives the team a clear direction of what parts of the product and business will be developed. At the same time, the team formulated a 5-years vision about what sort of service the company Ovelin

wants to develop eventually. However, unlike the Business Model Evolution approach, the intermediate steps are not anymore formulated to great detail.

Interestingly, the term Business Model Evolution might actually fit the newly adopted approach better than the original one that was used for in this thesis. Like in biology, the evolution of the business model should take into account the development and adaptation of the previous stage to the environment. Planning 5 years ahead over 6 stages may be possible if the environment does not change, and no new knowledge is being generated. However, in a fast changing environment like ICT and web services, this is definitively not the environment a company finds itself in.

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